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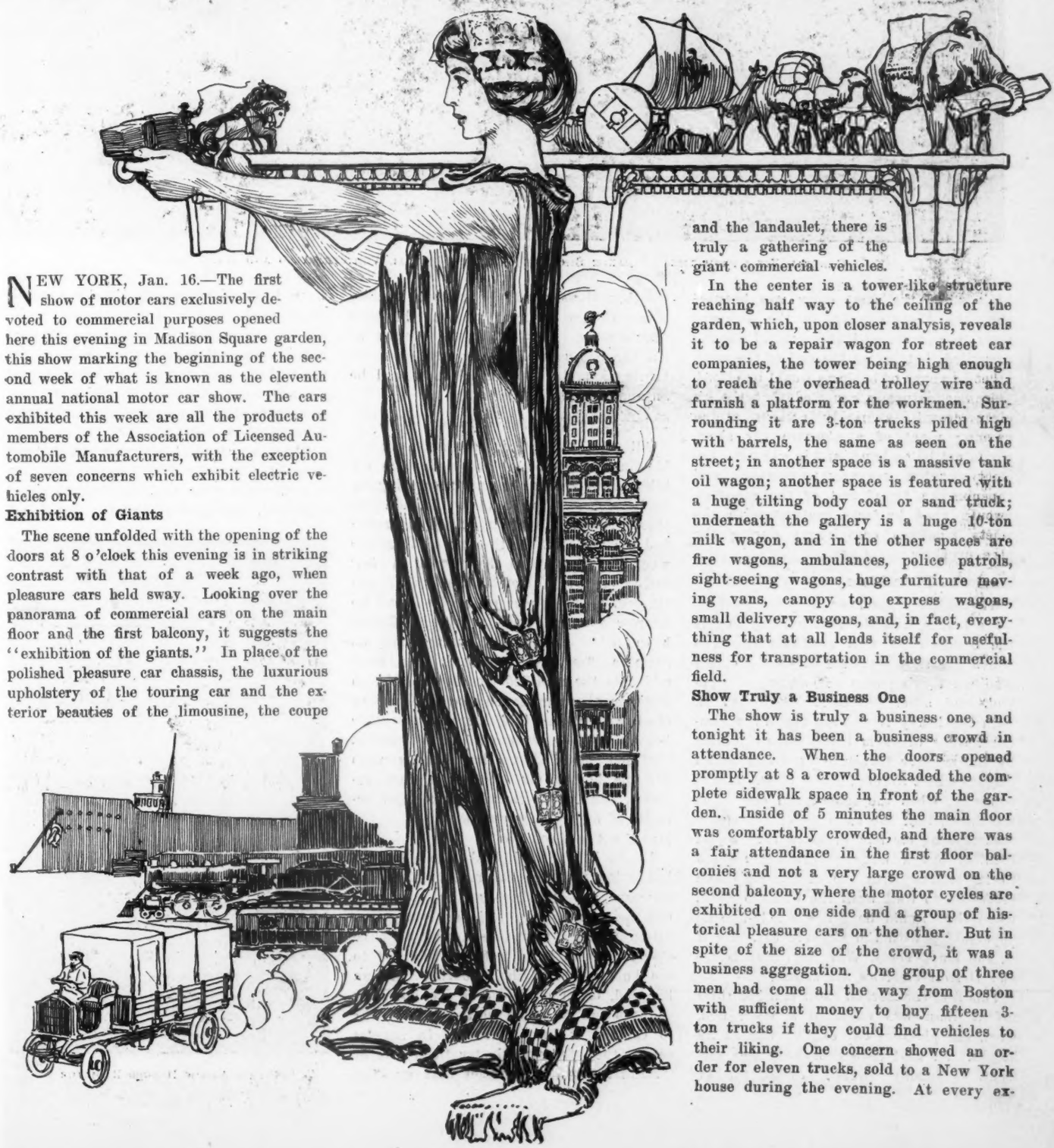
MOTOR AGE

Nation's First Commercial Car Show



NEW YORK, Jan. 16.—The first show of motor cars exclusively devoted to commercial purposes opened here this evening in Madison Square garden, this show marking the beginning of the second week of what is known as the eleventh annual national motor car show. The cars exhibited this week are all the products of members of the Association of Licensed Automobile Manufacturers, with the exception of seven concerns which exhibit electric vehicles only.

Exhibition of Giants

The scene unfolded with the opening of the doors at 8 o'clock this evening is in striking contrast with that of a week ago, when pleasure cars held sway. Looking over the panorama of commercial cars on the main floor and the first balcony, it suggests the "exhibition of the giants." In place of the polished pleasure car chassis, the luxurious upholstery of the touring car and the exterior beauties of the limousine, the coupe and the landaulet, there is truly a gathering of the giant commercial vehicles.

In the center is a tower-like structure reaching half way to the ceiling of the garden, which, upon closer analysis, reveals it to be a repair wagon for street car companies, the tower being high enough to reach the overhead trolley wire and furnish a platform for the workmen. Surrounding it are 3-ton trucks piled high with barrels, the same as seen on the street; in another space is a massive tank oil wagon; another space is featured with a huge tilting body coal or sand truck; underneath the gallery is a huge 10-ton milk wagon, and in the other spaces are fire wagons, ambulances, police patrols, sight-seeing wagons, huge furniture moving vans, canopy top express wagons, small delivery wagons, and, in fact, everything that at all lends itself for usefulness for transportation in the commercial field.

Show Truly a Business One

The show is truly a business one, and tonight it has been a business crowd in attendance. When the doors opened promptly at 8 a crowd blockaded the complete sidewalk space in front of the garden. Inside of 5 minutes the main floor was comfortably crowded, and there was a fair attendance in the first floor balconies and not a very large crowd on the second balcony, where the motor cycles are exhibited on one side and a group of historical pleasure cars on the other. But in spite of the size of the crowd, it was a business aggregation. One group of three men had come all the way from Boston with sufficient money to buy fifteen 3-ton trucks if they could find vehicles to their liking. One concern showed an order for eleven trucks, sold to a New York house during the evening. At every ex-

GENERAL VIEW FROM THE ENTRANCE SHOWING DETROIT, GENERAL VEHICLE, ALCO AND MACK EXHIBITS

hibit stand the same story was heard—that the visitors were, in the accepted term, live ones, and the general feeling prevailed that before the end of the week a good amount of business would be closed.

It was naturally expected that the society crowd, invariably present at an opening night of a pleasure car show, would not be on hand, and it was not. Society was but meagerly represented, and the common tweed suit of the salesman was in good business contrast with the white front so conspicuous during the pleasure show.

Trucks on Main Floor

The entire main floor is given over to large trucks, and the first balcony houses the overflow as well as those concerns which are showing what might be called modified touring cars for ambulance, patrol, and other purposes. Sprinkled in with the heavy trucks are the seven electrics, some of them being almost hidden by the massive furniture vans and barrel wagons which towered above them. It was expected, when the commercial show was scheduled, that the majority of the manufacturers of electric pleasure cars would exhibit, but a large percentage refused to be classed with the commercials and preferred to wait until the Chicago show, when they would be given a side-by-side opportunity with the pleasure car. As it is, the Hupp-Yeats, Waverley, Studebaker and Detroit electrics are shown.

This first commercial show is a healthier infant than was expected a week ago, when the pleasure car exhibit was at its height. At that time everybody was reticent. Nobody would even predict whether there would be enough visitors to even make a sprinkling over the main floor or not. Now, that the success of the show is assured, it is a foregone certainty that the commercial show will be an annual affair in this city.

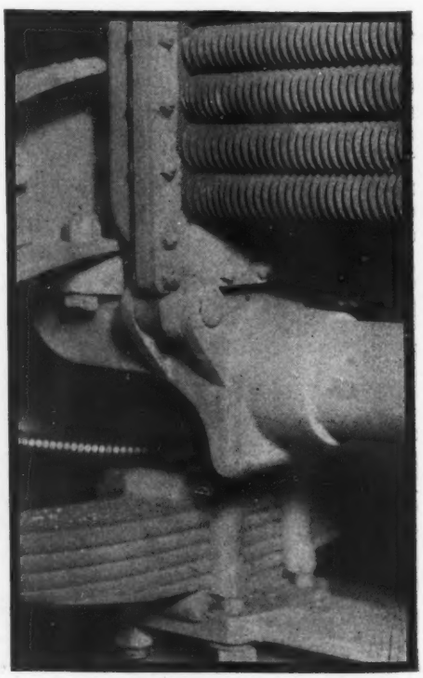
Thirty-three Concerns Showing

All told, thirty-three concerns are exhibiting vehicles. Of these nineteen exhibit heavy trucks ranging in carrying capacity from 1 to 10 tons. In addition there are seven concerns exhibiting modified touring cars. With some of these the wheelbase has been lengthened a few inches, the side members of the frame trussed, a lower gear ratio fitted, and an express type of body provided. Others have fitted ambulance bodies, and on some a fire chemical outfit has been added to the modified pleasure chassis. In addition, there are seven concerns showing electric cars. All told, there are fifty-five heavy trucks, seventeen truck chassis, nineteen modified touring chassis with suitable bodies, six electric pleasure vehicles, and twelve electric commercial vehicles of one type or another.

Healthy Condition Noted

In the heavy truck field it is a healthy indication to note that many of the big concerns are entering and have brought out their first truck. It is a salutary condition to note that these concerns have started out to build a truck, and not to see how much of their touring car can be used, or in other words see how few changes can be made in the touring car to convert it into a truck. In several cases the factory instructions were: "Build a truck and forget that we ever have built pleasure cars." As a result some trucks that will compare well with leading types abroad have been brought out. A moment's glance shows that they are real commercial giants, and do not bear a single trace of similarity with the pleasure cars of the companies which have brought them out.

There are several concerns which have brought out their first commercials during the past year and are new faces in this field, among these being Pierce, Peer-



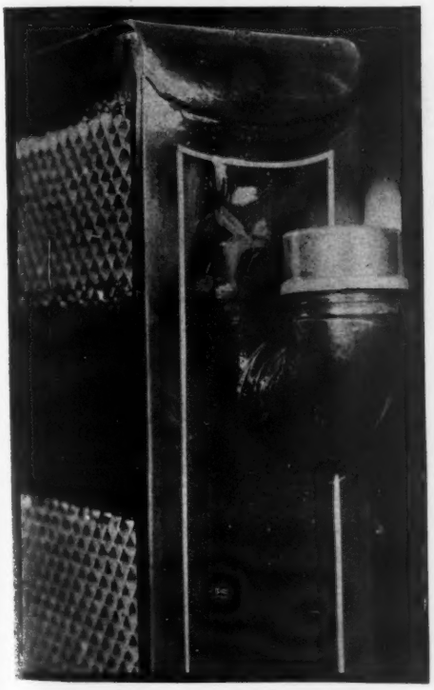
PIERCE-ARROW HINGED RADIATOR

LOOKING TOWARDS ENTRANCE WITH THE PACKARD EXHIBIT IN THE IMMEDIATE FOREGROUND

less, White, Stearns and Kissel. The old concerns, such as Knox, Packard, Mack, Garford, Hewitt, Sampson, Grabowsky, Rapid, Autocar, Randolph and Morgan are on hand.

In the electric field Studebaker, General Vehicle and Lansden show heavy trucks, and Detroit, Waverley, Hupp-Yeats and Ward light electric deliveries.

A cursory glance over the different exhibits reveals many tendencies of commercial construction. There is but one firm using friction drive, this being the Garford, which employs it on its 1, 2 and 3-ton trucks. The Reliance company, which heretofore has built two-cycle trucks exclusively, has brought out two four-cylinder, four-cycle types and shows the two-cycle motor in but one model exhibited. The new Pierce 5-ton truck uses worm drive. This is the only big truck employing shaft drive in the show, all of the others using side chains. This shaft-driven chassis has created much talk and reminiscent ones have referred to the first pleasure car show, at which a shaft-driven car was exhibited, and the present wonder is, will the commercial vehicles drift to the shaft drive, the same as pleasure cars have. The Knox fire wagon is the only six-cylinder machine in the show. It is also the only American-made fire apparatus shown in which the engine which drives the car along the street is also used to drive the pump which forces the water, the pump being an integral part of the chassis.



GRABOWSKY RADIATOR AND CONDENSER

Some of the Body Styles

The body style in the commercial trucks is an indescribable, unknown quantity. It depends entirely on the whims of the buyer. Whatever he wants the manufacturer will give if he is willing to pay the price. The result is that many of the makers list but one standard body, and the trucks exhibited are in many cases sold and awaiting delivery as soon as the show closes. As a result several studies in bodies are afforded. Many are specially designed for the barrel trade of breweries, Packard, Mack, Studebaker and General Vehicle showing bodies suited for this work and filled with their carrying capacity. The desirability of the truck for coal and sand carrying is shown in the tilting bodies exhibited by White, Mack and Reliance. The White is specially designed for sand work, and can be tilted by the driver working a crank at the side of the vehicle. The body is carried on rollers on a track which has a steel curve at the forward end, up which the roller travels when tilting. On the Mack the forward end is supported on two heavy chains, which pass over pulleys on a framework back of the seat. The sprockets are operated by crank. So far in tilting bodies the tendency is to tilt rearward.

Immense Vans are Shown

Both Packard and White show immense van-type cars, well suited for furniture houses or moving companies. The body part, or storage space, extends over the heads of the drivers in one of the types. The Garford company shows an accessible furniture body which has the usual rear doors, and in addition a side door on the right and left for loading and unloading pianos where sufficient street space does not allow of backing the truck up against the curb. The biggest vehicle in the show is the Hewitt 10-ton milk truck, which has a body built to carry 385 metal boxes containing a dozen milk bottles each. In the Autocar section is a particularly novel bank body. It is made throughout from pressed steel, thick enough to resist a revolver shot, and the door has a combination lock the same as used on a safe. The door hinges are of the safe type. Win-

HEWITT STAND WHICH CONTAINS 10-TON TRUCK, THE GIANT OF THE ENTIRE SHOW

dows are fitted with heavy bars inside and in addition are sheet steel shutters, which can be used to fill the entire window space if necessary. These shutters are on the inside. An arrangement is provided whereby the person inside can control the motor in case the wagon should be taken possession of bodily by bandits or others. This wagon is suitable for large corporations as a pay wagon, or for banks which do a soliciting business outside of their main office.

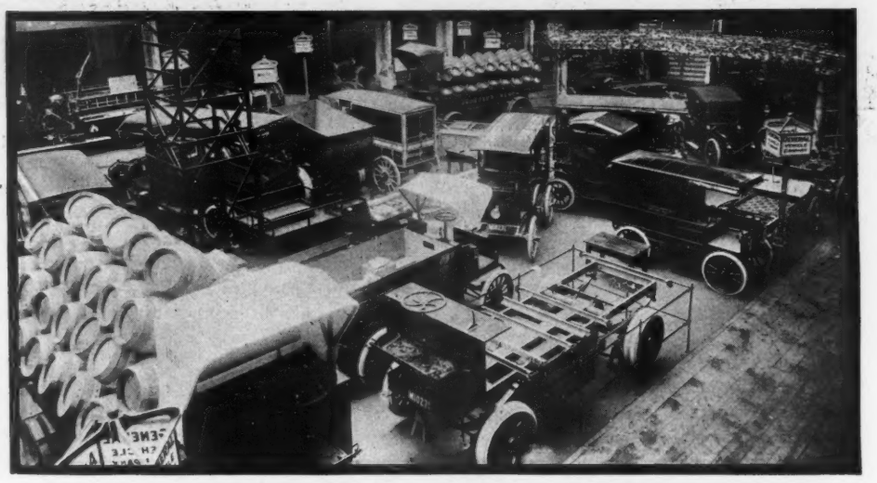
Fire Engine Vehicles

Four concerns show fire engine vehicles, the leader being the Knox with its combined pump, hose wagon and chemical outfit. The Packard company shows a combination chemical and hose wagon, as do the Autocar and Pope companies.

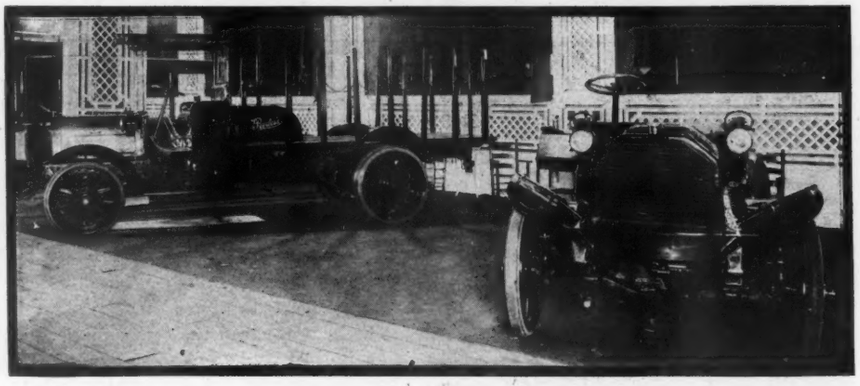
One useful feature at the show is the Packard loading truck exhibited in connection with a regular truck. This loading truck is a four-wheel platform on which the truck body can be slid onto when empty. This hand truck with the body can be moved up to the loading platform of a warehouse and the load put on, and when ready can be slid onto the truck platform. In this way the company with one truck can have three or four bodies so that two can be loaded while the truck is delivering the load on the third. Makers are realizing that too much valuable time is wasted in keeping a truck standing idle while the load is being put on. In a word, if a 3-ton truck is to successfully compete on short hauls against horse vehicles it must use this loading system. A truck adaptable for this work is provided with a regular platform body on which are two longitudinal grooves to guide the movable body in place. Once in place the movable body is locked by a vertical pin at each side. One man can load and unload the movable body without much trouble.

Generally speaking the commercial vehicle exponents are puzzling with many questions of design at the present time. One of the most important of these is whether the driver shall sit above the motor or whether behind it, as in the regular touring car. Those concerns who place the driver directly above the motor have many reasons for this. Foremost comes the greater loading space without making the wheelbase too long. Exponents of this type of construction are Knox, Mack, Kissel, Reliance, Garford, Sampson, Rapid and Grabowsky.

On the other hand, there are many concerns who prefer to place the driver back of the motor, as in touring car fashion, some of the exponents of this idea being Packard, Peerless, Pierce, Stearns, White, and some of the Mack vehicles. These concerns argue



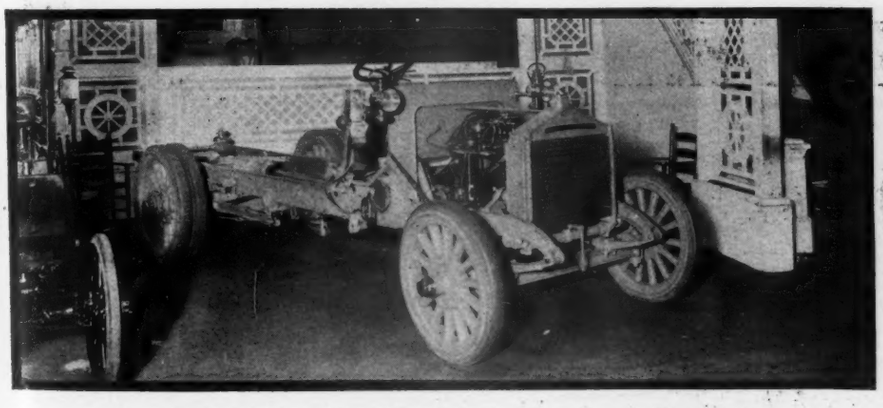
LOOKING DOWN FROM BALCONY ON GENERAL VEHICLE DISPLAY



PEERLESS COMPANY MAKES DEBUT AS TRUCK MAKER

WHITE COMPANY SHOWS A COMMERCIAL LINE THAT COVERS A WIDE RANGE

MACK DISPLAY WITH PACKARD IN BACKGROUND



CHASSIS OF THE NEW PIERCE-ARROW SHAFT-DRIVEN TRUCK

that their main object is to almost balance the loading platform over the rear axle, so that the maximum of traction on the rear wheels is had and so that there is a maximum braking efficiency. They further claim that by mounting 75 per cent or more of the useful load on the rear axle they can use light front springs and so give a resilient support to the motor and free it from the constant vibration it would be subjected to with heavy springs. They further advance the claim that where too great weight is placed on the front wheels the steering difficulties are increased.

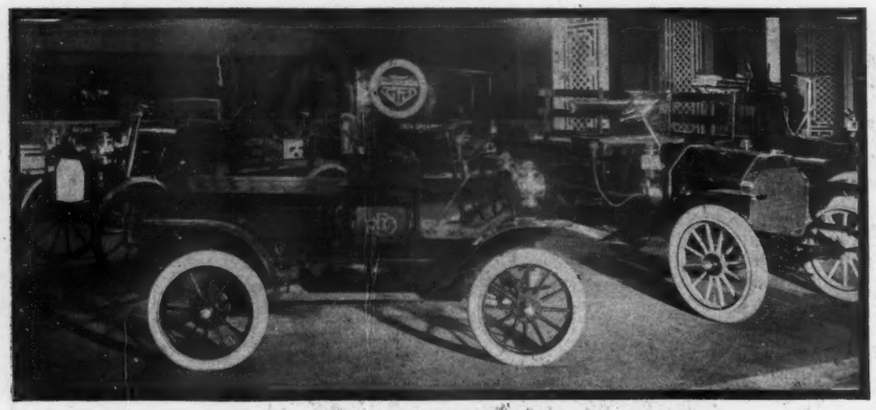
When it comes to the problem of turning the shorter wheelbase naturally has the advantage. The new Pierce truck, in which the driver sits behind the motor, carries 90 per cent of the load on the rear axle and can be turned in a circle 52 feet in diameter. The new Peerless truck, in which the driver occupies the same position, can be turned, according to the company's statement, in a circle 50 feet in diameter. Concerns in which the driver's seat is carried above the motor claim to be able to turn the truck in a circle having a diameter of from 44 to 48 feet.

Saving of Space

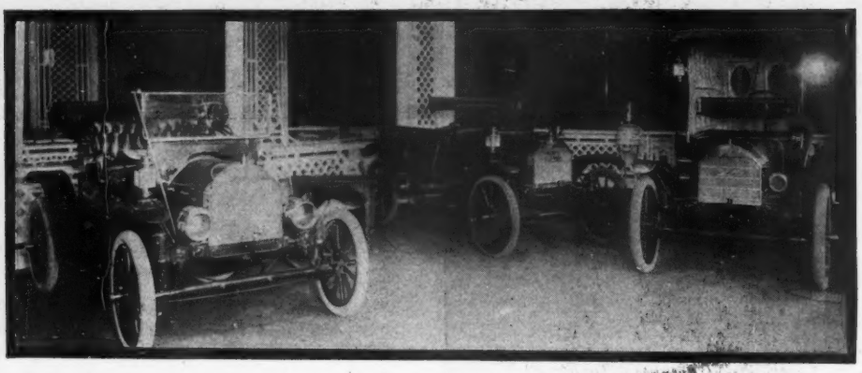
There is a third class of builders in which the space occupied by the motor and the driver's seat is economized to the greatest extent, the exponents of this class being the Hewit and Morgan companies. These makers place the four-cylinder motor between the driver's seats. The body is very wide and the driver sits at the right side of the motor and the other passenger at the left side. The motor nests snugly between them and is covered by a semi-circular steel hood made in halves, each half moving out of sight much like the cover of a roll top desk. These concerns also hinge the seats, so that they can be swung up out of position, and give accessibility to the clutch and other parts. Such concerns as Knox, Alco, Sampson, Mack and others, which place the seat directly above the motor, furnish accessibility by doors under the seat and which when open expose the entire motor.

With some concerns like the Autocar using a two-cylinder opposed motor located transversely on the front of the chassis, a handle is provided which by turning lifts the seat entirely up out of position and exposing the motor and its parts.

All of the truck makers talk accessibility of the motor, gearbox, and other parts. It is a recognized quantity in commercial architecture that the parts must permit of quick removal, otherwise the truck is held out of commission. There are some leaders in this problem of accessibility. One is the Gra-



REO WITH ITS COMMERCIAL LINE MAKES ITS BOW



BRUSH PROMINENT WITH ITS LIGHT DELIVERY WAGONS

bowsky, using a two-cylinder opposed motor mounted transversely in front. The motor and planetary gearset are carried on a subframe, the longitudinal members of which slide on two corresponding members on the main frame, so that one man in a few minutes can withdraw the complete motor and gearset. All that he has to do is to pull out a bolt and swing the front cross member of the frame to the side; two threaded unions in the muffler pipe have to be loosened; three radiator unions are loosened; one gasoline union is released and one main plug for the ignition system withdrawn. This done, the motor is a free agent and with it is carried all of the pedals controlling the hand brake and the gearset.

Features of the Morgan

On the Morgan truck a four-cylinder en bloc motor is located in front between the drivers' seats. The motor is supported on two semi-circular cross pieces. To remove it a hook threads into the casting head between the second and third cylinder, and with the aid of block and tackle without removing the radiator, body, or gearbox, the motor can be lifted out.

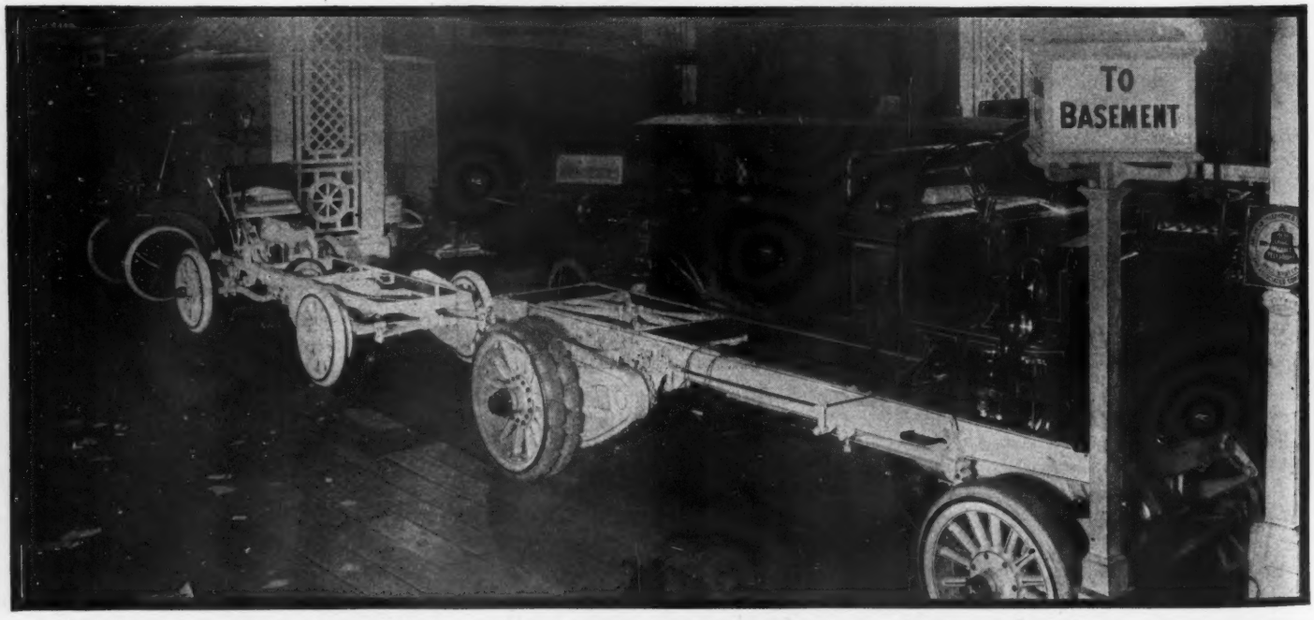
On the new Pierce truck both the motor and gearbox is carried on a three-point support and by removing two bolts and loosening the nuts in two others the gearbox can be moved forward 1¼ inches off its supports and dropped to the ground, not a floorboard of the body having to be taken out. This truck uses a worm-driven rear axle, illustrated in another place in this issue. Both the worm and wheel are carried in the cover of the axle housing and by removing ten nuts both can be lifted out by tackle. There is a door in the truck platform to allow of this demountability.

Accessibility of Hewitt

On the 10-ton Hewitt truck, with its motor located between the driver's seat and the seat of his attendant, special accessibility features are made use of. The motor is mounted on guides and when the radiator is taken off it can be slid out through the opening in the pressed steel dash, which is ordinarily filled with the radiator. The lower part of the crankcase of this motor is not bolted to the crankcase proper but is held thereto by three metal straps. One bolt anchors each strap in position, which allows of dropping the lower half of the case in a few minutes.

Nearly all of the car manufacturers have realized that the parts should be supported to meet the frame members rather than above them, so that in case of repair it will not be necessary to take the body off the chassis.

There is all through the truck exhibited an evidence of determination on the part of the manufacturer and not the blacksmith-shop job that was so evident on some of the beginners in the truck business 2 years ago. The real truck is as carefully thought out and designed a product as the touring car. The material is looked after to the same



ALDEN SAMPSON EXHIBIT INCLUDES SEVERAL CHASSIS WHICH MAKE INTERESTING STUDIES

extent. White uses an I-beam section chrome nickel steel framework; Pierce uses a channel section Carpenter's manganese steel frame heat treated; and so with many of the other concerns. It is customary to employ chrome nickel steel in the gears and shafts of the gearset and to carry the shafts on annular ball bearings. The majority of the makers use Timken roller bearings to carry the front and rear wheels, using two races of these bearings in each wheel.

New Motors on Some

Such concerns as Pierce, Peerless and some others who have brought out new trucks have used a new motor. The Pierce motor has 4⅞-inch bore and 6-inch stroke. These measurements are different from those used in the pleasure car. The motor is designed to run at 900 revolutions per minute with the truck traveling 13 miles per hour. The motor speed is controlled by centrifugal governor on the camshaft, this governor operating on a butterfly throttle in the intake manifold. This is a longer stroke motor than employed on Pierce pleasure cars, the ratio of bore to stroke being 1 to 1.23.

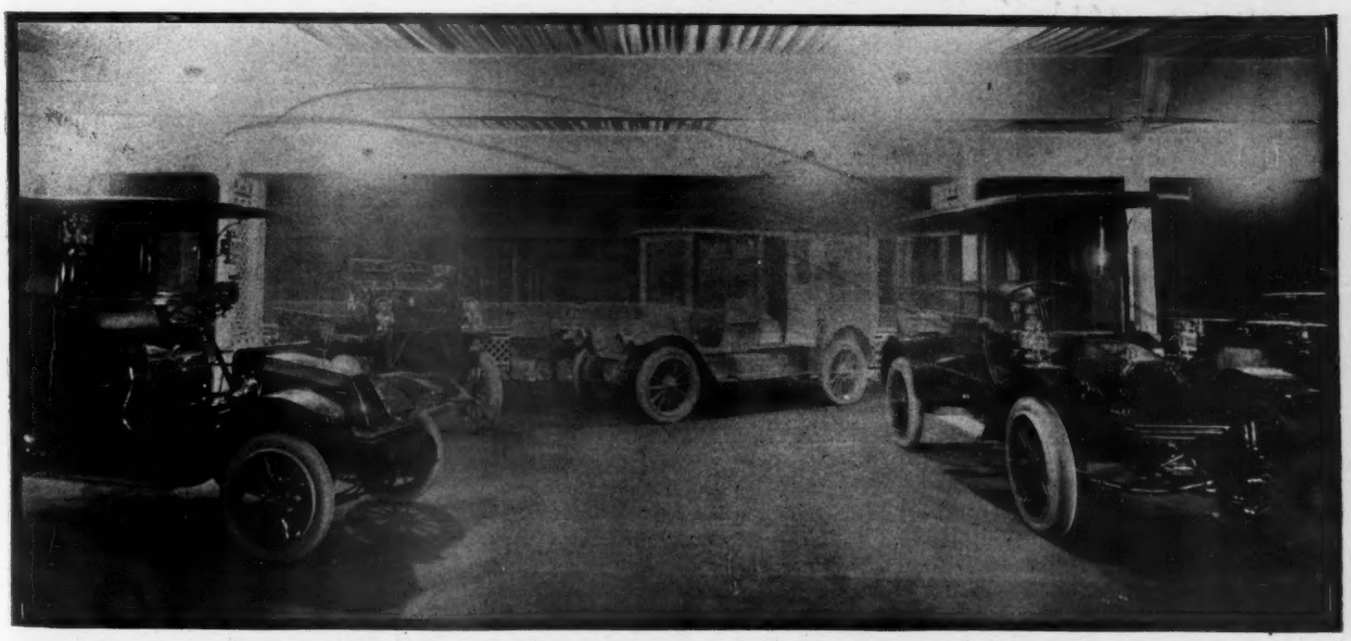
On the Peerless truck the motor is 4½ by 6½, which is 1 to 1.4 ratio of bore to stroke. This is a much longer stroke motor than used in the Peerless pleasure cars and this motor is made with governor control, the governor acting on a butterfly in the manifold. The motor is built to run at a speed of 925 revolutions per minute, which is a piston speed of 1,000 feet per minute.

An entirely new type of four-cylinder motor is introduced on the Hewitt 10-ton truck. Like the Pierce and Peerless, it is of the long-stroke type, with 4¼-inch bore and 6-inch stroke, and is designed to give its working efficiency at 1,000 revolutions per minute, above which speed a centrifugal weight governor cuts in. This motor has several characteristics. The hot air intake to the carbureter is cast integrally with the rear cylinder casting and only hot air is used in the carbureter. As already mentioned, the lower half of the crankcase can be removed in 2 minutes because of its being supported on three metal straps. The lubricating oil is delivered by a pump into a reservoir cast integrally with the waterjacket of the cylinders, so that the oil, before feeding to the crankcase and bearing parts, is warmed to the temperature of the waterjackets.

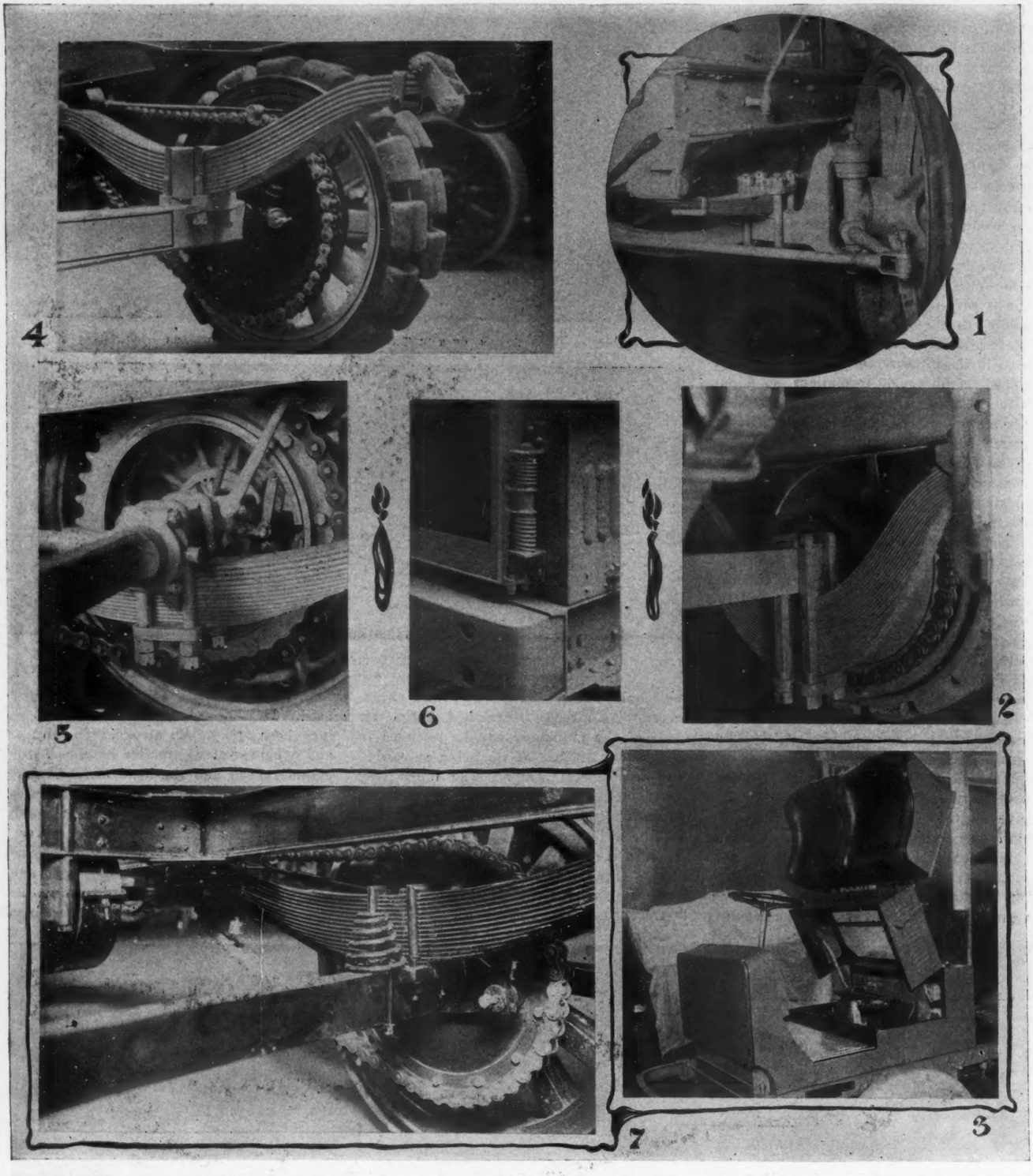
On the Morgan truck a special type of four-cylinder valve-in-the-head motor is used. It is a short-stroke type, with 5-inch bore and 4-inch stroke. The intake and exhaust valves are side by side in the cylinder head and the head is removable, being held in the cylinder top by a series of five bolts. This head is waterjacketed. The motor uses the de Dion oiling system, in which the oil is fed to the center bearing of the crankshaft and thence through the drilled shaft to all of its bearings as well as the lower connecting rod bearings

ATLAS, OF THE TWO-CYCLE TYPE, SHOWS TAXICABS

LIGHT TRUCKS AND DELIVERY WAGONS ON OVERLAND STAND



FRANKLIN, ONE OF THE PIONEERS, SHOWS A LINE OF ITS AIR-COOLERS



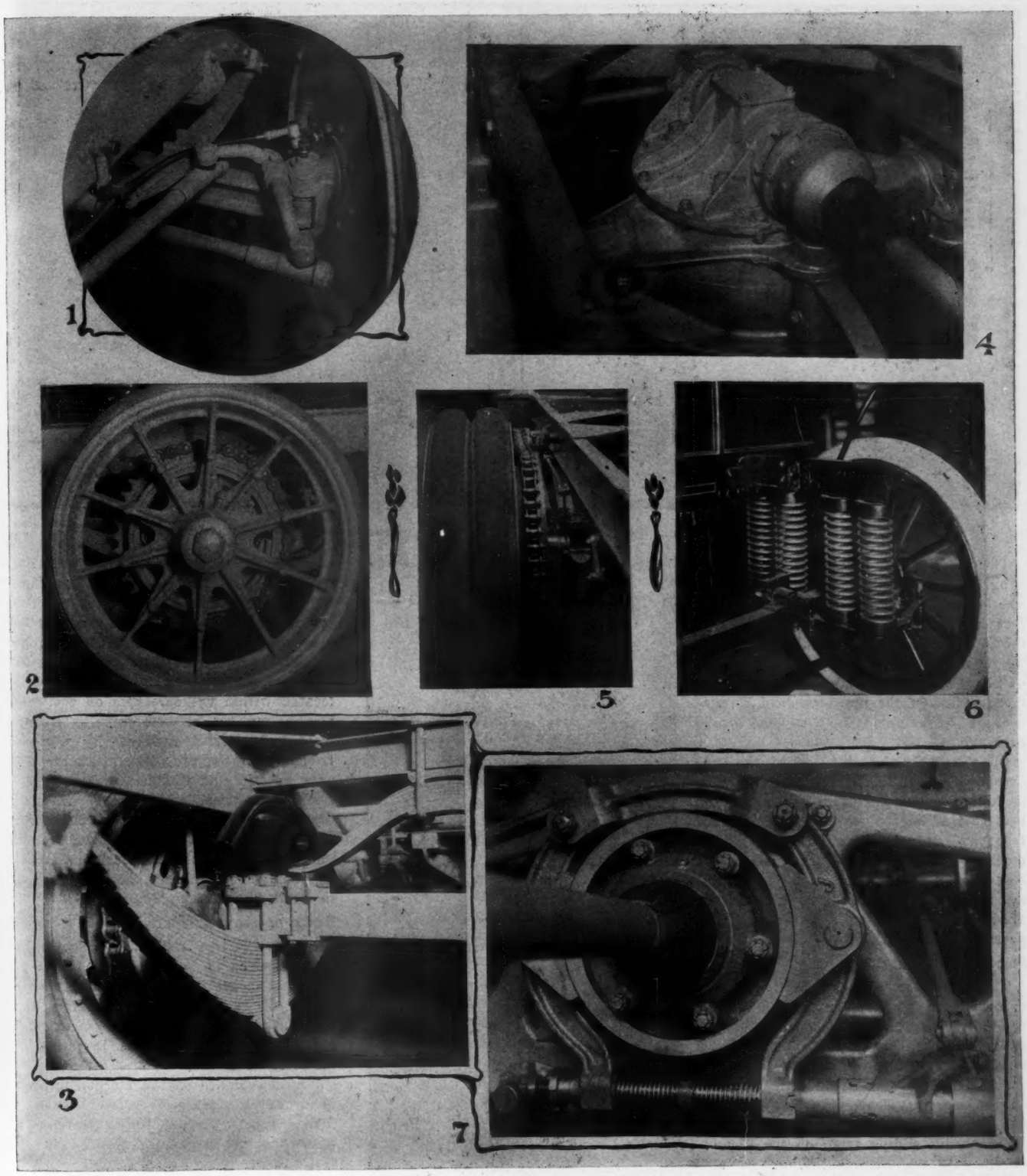
PICTORIAL REPRESENTATION OF SOME TRUCK DETAILS—PHOTOGRAPHS BY N. LAZARNICK. 1—WHITE STEERING KNUCKLE AND ACCESSIBLE SPRING CLIP BOLTS; 2—SUSPENDED REAR SPRING ON HEWITT 10-TON TRUCK; 3—AUTOCAR SEAT RAISED BY HANDLE GIVES ACCESS TO MOTOR; 4—PACKARD REAR AXLE AND SPRING; 5—WHITE REAR AXLE AND SPRING; 6—ALCO SPRING RADIATOR SUPPORT; 7—PEERLESS REAR AXLE, SPRING AND BUMPER SPRING. THE STRENGTH OF THE MANY PARTS IS NOTICEABLE

and by way of pipes on the connecting rod to the wristpins.

On the Knox trucks the regular touring motor only with larger parts is fitted. It is a short-stroke type, 5-inch bore, 4¾-inch stroke, and fitted with a governor permitting of a maximum of 1,200 revolutions per minute. This speed is claimed to give the 5-ton truck 8 miles per hour, the 3-ton 12, and the 2-ton 15 miles per hour.

On the Alco the regular touring car motor of four-cylinder type is used. It has a 4¾-inch bore and 5½-inch stroke, with a governor on the mixture supply set to operate at a speed of 9 miles per hour on direct drive. The car is geared for 2 miles per hour on low and 5 miles per hour on intermediate speed for road use.

The problem of weight distribution between the front and rear wheels has been carefully worked out by many of the makers. The Pierce truck is made with a wheelbase 13 feet long and a load-carrying platform 12 feet long. The frame has an overall length of 20 feet, 8 feet being used for the motor and driver's seat.



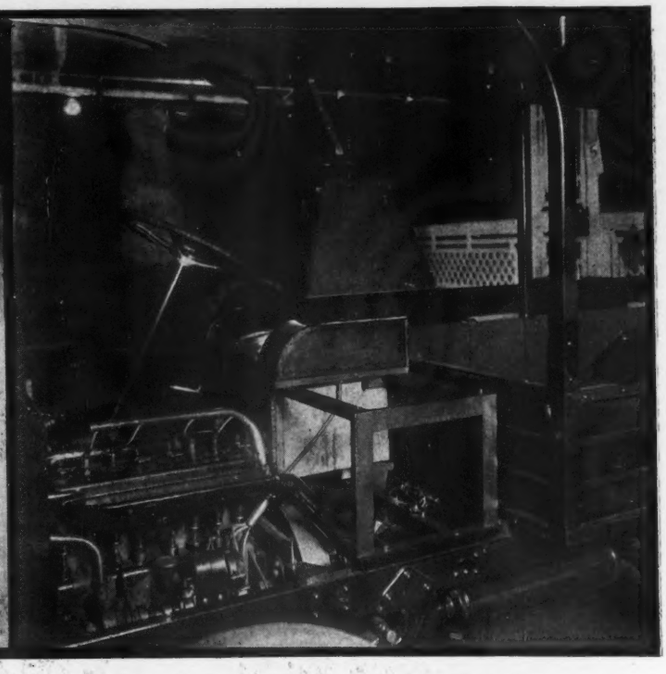
PICTORIAL ILLUSTRATIONS OF TRUCKS SEEN AT GARDEN—PHOTOGRAPHS BY N. LAZARNICK. 1—STEERING CONNECTIONS ON PIERCE-ARROW TRUCK; 2—CAST STEEL ROAD WHEEL OF WHITE TRUCK; 3—SUSPENDED REAR SPRING ON ALCO TRUCK; 4—PIERCE-ARROW REAR AXLE WITH WORM DRIVE; 5—ALCO DUAL REAR TIRES AND CHAIN DRIVE; 6—LANSDEN FRONT SPRING; 7—PIERCE-ARROW SEGMENT GEARBOX BRAKES WHICH ARE EXPANDED BY CAM ACTION ON THE HORIZONTAL SHAFT UNDER THE BRAKE

Ninety per cent of the load is carried on the rear wheels.

The Peerless truck has a wheelbase of 12½ feet and a load platform 12 feet in length. The overall length of the frame is 19 feet, giving 7 feet for the motor and driver's seat. The frame has approximately 5 feet overhang back of the rear axle. This truck carries approximately from 85 to 90 per cent of its load on the rear axle.

On the Morgan truck, with the motor between the driver's seat, the wheelbase lacks 3 inches of being 12 feet. The frame length from end to end is 17½ feet. The load platform is 13½ feet in length, overhanging 3½ feet back of the rear axle. Sixty-five per cent of the load is claimed to be carried on the rear wheels and 35 per cent on the front wheels. The steering mechanism of this truck includes a ball-thrust bearing in the top of the steering knuckle, which carries the load. This ball race has 14 ⅝-inch balls, and it is claimed with such provision that the extra load on the front wheels when the car is loaded does not effect steering.

MOTOR ACCESSIBILITY ON THE KNOX



MOTOR BETWEEN SEATS ON THE HEWITT

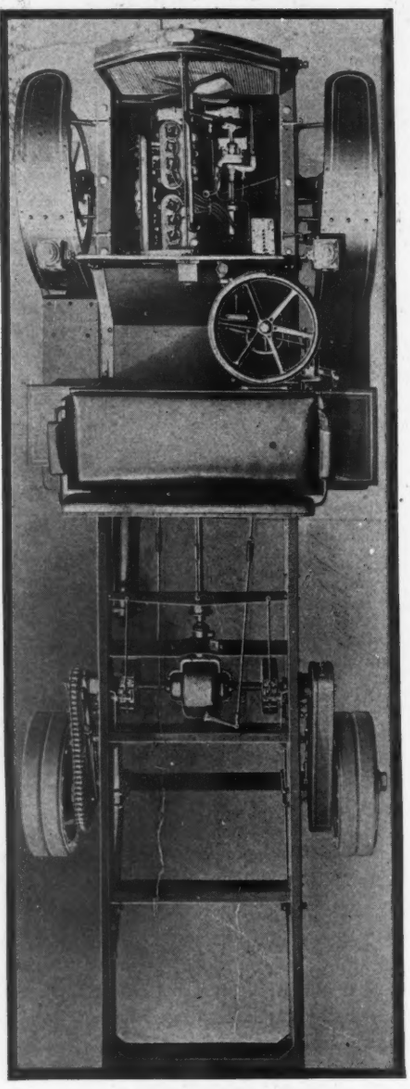
The Knox trucks employ a good overhang of the framework on the back axle. The 5-ton chassis has a wheelbase of 12½ feet and a total frame length of 17½ feet. Seventy per cent of the gross weight of the truck with load is supported on the rear axle and 30 per cent on the front axle. Of the net 5-ton load 50 per cent is by actual weight supported on each axle.

On the Packard and Kissel trucks the overhang of the body over the rear axle is followed, but the exact proportion of load carried on the rear axle and on the front axle is not known. On the White trucks a long overhang is used and 75 per cent of the load carried on the rear axle and 25 per cent on the front. These trucks are made with a 12-foot wheelbase and an overall frame length of 19½ feet.

Selection of Gearsets

There remains much difference of opinion with truck manufacturers as to whether selective, progressive, progressive sliding, or planetary gearsets are more desirable. As in the touring car, all four are in vogue. The Garford uses friction; on the Morgan, Grabowsky and Hewitts are planetary sets; the Packard employs a progressive sliding type; on the Pierce, Peerless, White, Alco and Knox are selective sets, and on the Mack is an individual clutch type. The Hewitt company uses a two-speed planetary on its 10-ton truck. A four-speed set is used on the White, Peerless, Kisselkar, Pope-Hartford and Sampson. Practically all of the other concerns which are in the show employ a three-speed set.

It is on the question of brakes that the magnitude of the commercial car appears. The customary method of mounting the brakes is to put one set on the jackshaft and the other set on the rear wheels. The



KISSEL, SHOWING OVERHANG

rear wheel set is invariably of the expanding type and located within the drum-shaped sprocket for side chain drive. The jackshaft brakes are quite frequently of the expanding type, because they can be made more dirt-proof than the band style. On the Pierce truck one set of brakes is located within the sprockets on the rear wheels and the service brake is a segment type carried back of the gearbox. It consists of two arc-shaped segments, the arcs engaging approximately three-quarters of the drum, which is 10 inches in diameter and 3 inches wide. The shoes are faced with German bronze and are applied through a cam. The rear brakes are expanding shoes, bronzed faced, and acting in drums 20 inches by 4½.

Brake on the Peerless

On the Peerless truck the service brake is a wheel on the right half of the jack shaft, 14 inches in diameter and 4 inches wide. It is supported direct from the differential. The rear brakes are expanding shoes working in drums 18 inches in diameter and 3½ inches wide. The emergency brakes on the Morgan operate in drums 18 inches in diameter and 4 inches wide. The friction surfaces are bronze against steel. On the Knox 5-ton truck there are two service brakes on the jackshaft in the form of raybestos bands acting on 14 by 4-inch wheel. The emergency brakes are fabric-faced shoes operating in drums 18 inches in diameter and 4 inches wide. On the 10-ton Hewitt truck the service brake is a reverse band on the planetary set and the emergencies are fabric-faced expanding shoes.

These figures are sufficient to give the general trend of brake construction on the different trucks marketed at present. It is customary to employ equalizers on the emergencies.

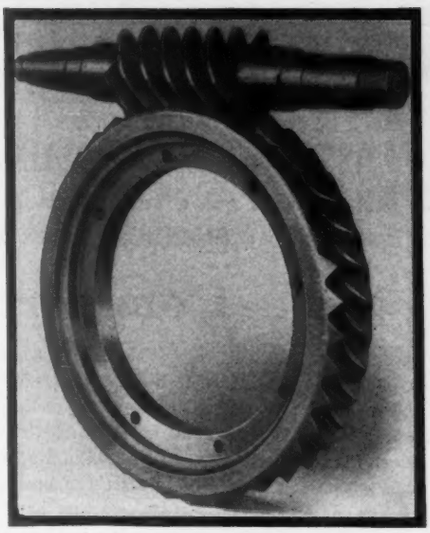
The normal strength of the big truck is well demonstrated in the matter of springs, some of the concerns using rear springs with as high as twenty-six leaves. The method of mounting these springs is illustrated on other pages of this issue. Where the number of leaves is so great there is only one way to do it and that is carrying them beneath the axle. This allows of the load platform measuring not more than 33 inches from the ground level. On the 10-ton Hewitt, the 5-ton Sampson, the 5-ton Alco, the 5-ton White, and others, the springs are supported beneath the axle in this way. On the Peerless and Packard trucks the springs are carried direct on the axle.

Some Use Transverse Springs

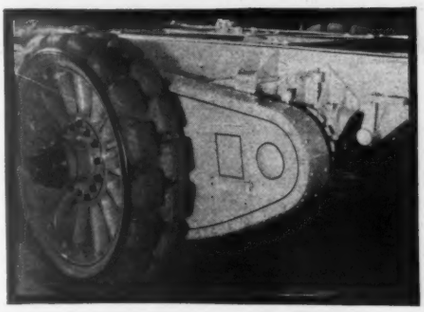
A few makers employ transverse springs in conjunction with the rear springs. It is an inverted semi-elliptic mounted above the axle and designed only to be used with the heaviest loads. Instead of an extra spring of this nature the Peerless truck is fitted with stiff coil springs above the axle. In the new Stearns truck the greatest novelty is carrying the subframe on which the motor and gearbox are located on two semi-elliptic springs in front. The rear end of the subframe is hinged to the jackshaft housing. This construction frees the motor and driver from the vibration not absorbed by the regular springs. On some of the Lansden electric semi-elliptics are not used, but a set of four vertical coil springs employed. On the Brush light delivery wagon a single coil spring at each corner is used. Instead of using supplementary springs some of the concerns use a peculiar form of leaf in the semi-elliptic. This leaf is practically horizontal at each end and deeply bowed down in the center. The horizontal portion is designed to carry the empty truck and the bowed portion of the leaf is brought into use to care for the load. This scheme is introduced to give an easy carriage to the truck when running without load.

Control Features of Trucks

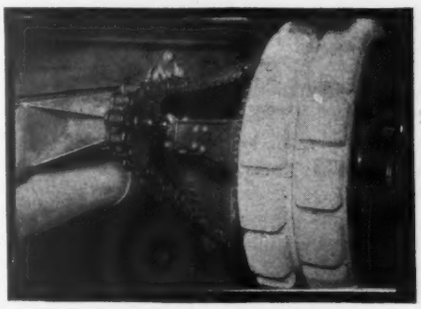
On all trucks the control is practically the same as employed on the touring cars. Right-hand drive is practically universal, there



PIERCE WORM DRIVE



SAMPSON ENCLOSED DRIVE CHAIN



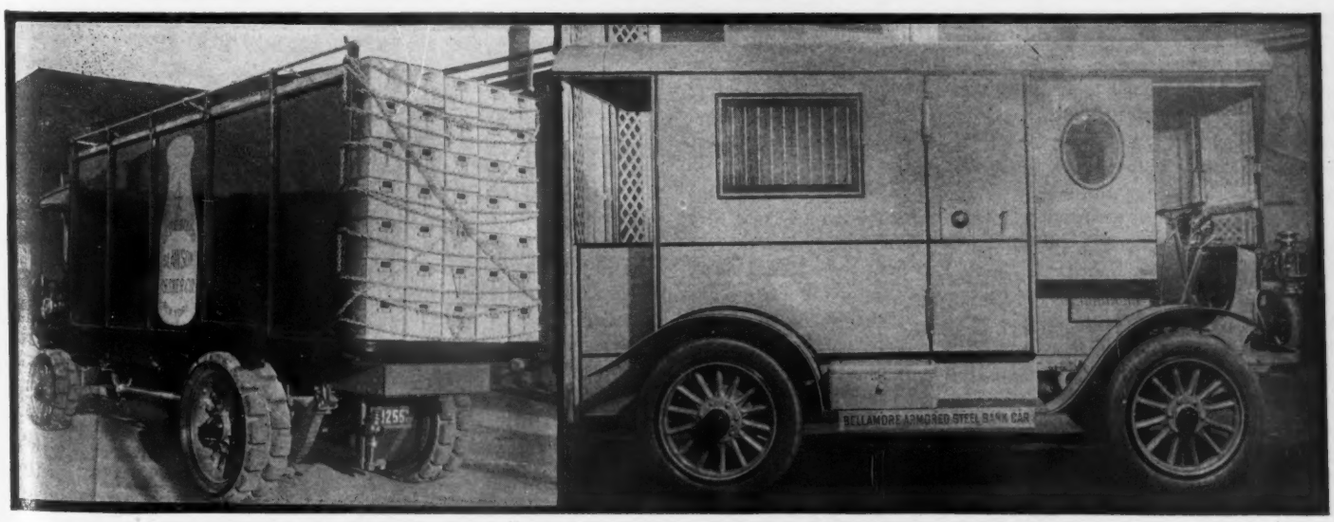
HEWITT RADIUS ROD DESIGN

only being two examples where the left-hand system is employed. The emergency brake and change-speed levers are at the right; the regular brake and clutch pedals are in the footboard; the accelerator pedal is generally used; and on the steering wheel are throttle and spark levers. The fixed spark is very little used. A year ago it was expected that it would have a wide range of usefulness, but practically all of the truck exhibitors show the spark control on the steering column. One maker explained his reasons for using it by saying that with the long-stroke motor and the speed variations from 350 to 1,000 crankshaft revolutions it was more desirable to have a control over the spark than to use the fixed type.

The majority of trucks fit the tubular radiator, some using the horizontal tube and some the vertical. On the Pierce truck the horizontal tubular type is used. It is hinged and supported at the base on tubular cross member of the frame. With a brace rod from the top of the radiator to the dash disconnected, the radiator will swing down to the front, allowing of the motor being removed. On the Alco, as illustrated on another page, the radiator is supported on each side between two vertical coil springs. On the Packard trucks the radiator is supported by a C-shaped spring at each side.

Getting Away from Vibration

All through there is an attempt to free this cooling member as much as possible from regular vibration. On the Grabowsky trucks, which use thermo-syphon circulation, the radiator is above the motor, and the top of the radiator is a condenser. Above the radiator proper is a water tank with a filler cap at the end of the radiator instead of on top of it. When filling the water cannot rise above the top of the tank, and so the condenser remains empty. The object of the condenser is to condense the steam given off by the hot water from the motor instead of letting it escape, thereby conserving the water supply. All of the trucks carry heavy metallic bumpers in front to protect the radiator. On the Hewitt a heavy screen is used.



THE HEWITT 10-TON TRUCK

AUTOCAR BURGLAR-PROOF BANK WAGON

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The Advent of the Commercial Vehicle

THERE opened this week in Madison Square garden, New York, the first commercial vehicle show which ever has taken place within this time-honored show center. Heretofore the commercial car has been pushed into the basement at the garden, where it had to be taken apart at times in order to be installed in place. This year a new regime has given place to the old. The garden has been cleared of the pleasure cars and for the first time in history the big truck, the light delivery wagon, the express wagon and the other types stand side by side on the main floor and in the two galleries of the garden, occupying the identical positions the pleasure cars held and being exhibited under the same setting. It is expected that with this coming to its own more city-wide enthusiasm will be created for commercial cars. Time conceals the answer.

THE commercial truck has been making phenomenal progress in many cities during the last 5 years, but the progress has not been so great as in many parts of Europe. In some American cities its progress has been retarded by the poor condition of the streets. Where streets are poor the upkeep on tires is abnormal and the wear and tear on the machines very great. There are, however, being organized in many cities special commercial vehicle organizations whose duty it is to look after the interests of these vehicles, and it is expected that a systematic course in street improvement will be started. In some cities the plan is being discussed of setting apart certain streets for motor use exclusively. This will prove a boon to the industry and to the question of street congestion as well. Those who have studied the situation in cities are familiar with the way the horse vehicles hold back the commercial cars. With slow-moving horse vehicles entirely excluded from the motor streets, the motor vehicle will be able to make that speed it is intended to travel at and streets best suited for rubber-tired vehicles will be made. Every large city should have its organization of commercial vehicle users to look after some of these conditions. Where motor clubs exist they can take up the work and are taking it up, but where they are not then the special organization becomes imperative and it should be formed by the tradesmen.

THERE have been several factors which have worked against the advance of the motor vehicle in America. One, and the most important one, is the too high speed that many of the makers state their cars will operate at. Many salesmen of commercial cars think their car must be able to travel at 25 miles an hour or the prospect will not buy it. It is a certainty in many such cases that the prospect knows more than the salesman. That commercial vehicle that can average 25 miles per hour and last is not built, and those cars that travel at such speeds are in the end going to be the poorest advertisement to the industry. Speed has been one of the worst enemies of the business car in the past. The cars of all classes have been running too fast and have been racking themselves to pieces. It is not so much speed as reliability that is needed. Speed will appeal to a few buyers at the start, but it is soon lost sight of as soon as the repair bills begin coming in and the breakdowns occur. It was not intended that a commercial car should be as fleet as a pleasure car, and if a firm cannot economically use a commercial car without running it at speed, then that house should buy pleasure cars, fit them with pneumatic tires and add some light form of load-carrying box to take the parcels to be carried and thus be able to get the speed that is desired.

A COMMERCIAL car is a business wagon and not a parade vehicle. Its life depends upon its use, and its popularity with its owner depends on its reliability and cost of operation. Primarily it must be reliable. The business man cannot afford to have a truck that will hold him up 30 minutes or 1 hour each day because of some breakdown; the business man's affairs have to go on schedule. If it is express that has to be transported it must reach a certain train or the value is lost; if it is freight it has to be at the depot at a certain hour and not 2 hours later; if it is a delivery to a buyer, the goods may be refused and the sale lost if not delivered at a certain hour. So it is in every department of life in which the commercial vehicle can play its part—it is reliability rather than speed that is wanted. The commercial vehicle is quicker than the horse vehicle and the business man wants it for that reason; but if it has speed and not reliability then he does not want it and will not continue to use it. You may dupe him into buying one, but he will only use it for a time if its reliability is not up to par, and in the end he will discard it and the net result is that the commercial vehicle has suffered more than it has gained. Sellers of these vehicles should be careful and use every discretion in this respect.

THE greatest problem today with the commercial car is the driver. It is necessary to use a skilled driver, one who is familiar with the mechanism of the machine, one who knows its ability and one who knows how to use it. Such a driver will call for more salary than the average horse driver and he should get it. But the trouble often arises that such a driver refuses to do all of the work expected of him. He wants to be a chauffeur and yet drive a commercial car. This cannot be. The driver of the commercial car also must be a workman to load and unload as is the custom today. But of greatest importance, this driver must be a dependable quantity. He must not have the race idea, that fondness to show the other fellow how fast he can go; that fondness for wasting time and then using the speed of the truck to make up for all losses. Moreover the truck driver must have brains. If anything happens along the street he must know whether it is the motor or rear axle that is giving the trouble. He also must be able to make a slight repair if occasion should arise on the road, otherwise before he reaches the garage at night the damage may be twice or three times as great.

IN order to make drivers more careful of their machines some owners insist that all repairs must be made by the driver. This has a salutary effect. If a driver knows that whatever goes wrong he must fix himself he is going to watch his machine very closely so that any growing defects will be nipped in the bud when it does not call for much time or expense to do it. In contrast to this system is that in which every car is run into a garage at night and a special force of men required to go over the cars. The driver does not care much if a trouble that shows itself at noon is let go all afternoon so that the night force can make the repair. During the afternoon much damage may be done. This system is then ruinous. It has proven most satisfactory in many lines of business to put every driver through an apprenticeship in a repair shop and when he takes a machine hold him responsible for the complete operation and repair of it. When this is done he is often more careful in the way he drives over street car tracks and over rough streets. This system works directly along the line of greater reliability of the machie and should find favor with the owner.

Paris Making Careful Count of All Its Motor Vehicles

Object is To Discover Exactly the Value of Each Car in Case of Mobilization for War Purposes

PARIS, Jan. 5—France is taking a census of all its motor vehicles. The numbering is not necessary to show how many cars are in use, for the annual taxation returns reveal this with accuracy. The object is to discover exactly the value of the motor vehicle in case of mobilization for war purposes. In order to obtain this knowledge every owner of a mechanically propelled vehicle, whether it be a light-weight motor cycle, a luxurious touring car or a 5-ton truck, is under an obligation to give particulars of it to the mayor of his township. The military authorities need to know the horsepower of the motor, the year in which it was built, the type of body, its speed, load capacity, the size and make of the tires, and the name of the man who usually drives the car. Failure to supply the particulars will entail a fine varying from $5 to $500.

Every Owner Must Report

But the declaration on paper is not all that is required. During the months of April and May every motor vehicle in France will have to be presented to a government commission for expert examination regarding its fitness for service in case of mobilization. The country will be divided up into districts, so that no driver will have to travel more than 12 miles to present his car to the examining committee. This is the first time that all the motor cars in France have undergone an expert governmental examination, and practically no exceptions will be allowed. The president is omitted from the formality, certain officials are exempt, and medical doctors are not called upon unless they possess more than one car. All other persons, including foreign residents, have to obey the call.

As the result of this examination there will be two distinct classes: cars fit for military service and those refused as too old or otherwise unfit for service with the troops. The accepted vehicles will be classified according to their varied capabilities, so that on the outbreak of war it will be possible to call upon them immediately to join the post designated. Periodical examinations will be held at intervals of 2 or 3 years, but in these the cars once refused as unfit will not again be called upon, the object of the succeeding examinations being to keep the official lists up to date.

Aeroplanes Will Be Counted

It is expected, too, that next year there will be a similar census and examination for aeroplanes. At the present time there probably are as many as 600 aeroplanes in France, and the opinion in official quarters is that these could be made a valuable addition to the fighting forces of the country.

Another important French firm has been converted to the slide valve motor. The Unic company has just secured the patent rights in France for the Reno motor, a description of which appeared in Motor Age a few weeks ago, and intends to employ it in place of some of its poppet-valve types. The purchase of the patent rights is so recent that it is not yet decided to what extent the motor will be used, but it is practically certain that it will be fitted in place of and not in addition to the poppet-valve models.

Reno a Slide-Valve Motor

The Reno consists of a four-cycle motor having a deep split compression ring in the combustion chamber providing with a reciprocating motion uncovering an intake port on its downstroke and the exhaust port on its upstroke. Since adopting the motor the Unic company has made a few changes in the operation of the reciprocating ring with a view to greater simplicity. Instead of a double cam giving a positive up-and-down motion to the pushrod operating the ring through a rocker arm, as shown in the first description, the company has made use of a single cam for lifting the ring and an external spring for its descent. By this change the camshaft is removed from its position in the crankchamber to a position half way up the cylinder, where it is contained within an aluminum housing. The change adds to the simplicity of the motor by using only one cam per cylinder and by exposing the camshaft, the bell crank lever and the rocker arm as soon as the cover of the housing is taken off. The spring is subjected to less heat than the springs of a poppet-valve motor, and is very much weaker than is necessary to properly seat a poppet-valve.

There appears to be no reason why the new type of operation should not be absolutely silent. The Unic company having taken up this motor is one building a medium type of car, and having a very important position in the taxicab trade, especially in Paris and London.

UNITED STATES TIRE CO. IS BORN

New York, Jan. 14—Under the laws of New York there was incorporated this week the United States Tire Co., with nominal capital of $500,000 and which, although the name does not suggest it, organization of the sales system of four of the best known tire companies identified with the industry—the Hartford Rubber Works Co., Morgan & Wright, the G & J Tire Co. and the Continental Caoutchouc Co., all of which are constituents of the Rubber Goods Mfg. Co., which in marks the first step toward a radical return is a branch of the United States Rubber Co. The United States Tire Co. will take over the sales departments and branch stores of the four companies and henceforth conduct them as one and generally keep the family relation close and harmonious.

E. S. Williams, president of the Rubber Goods Co., is the president of the United States Tire Co., and C. J. Butler, president of Morgan & Wright, is the vice-president. The other officials have not been elected, but the plan of organization already has been so well advanced that the men who will assume direction of the immediate affairs already have been chosen. They are J. M. Gilbert, general manager of the Continental Caoutchouc Co., who becomes general manager of the United States Tire Co., and J. D. Anderson, president of the Hartford Rubber Works Co., who will be the general sales manager.

Instead of the four separate sales departments that now exist, the country will be divided into three districts, each in charge of a district manager who has won his spurs as follows: Eastern district, O. S. Tweedy, with offices in New York; central district, A. I. Philp, with offices in Chicago; Pacific coast district, Joseph Weston, with offices in San Francisco. At present Tweedy is sales manager of the Continental company; Philp is vice-president and sales manager of Morgan & Wright, and Weston is secretary of the latter company. The headquarters of the United States Tire Co. itself will be located in New York.

Each Retain Corporate Existence

The four manufacturing companies will retain their respective corporate existence and their officials will not be disturbed, but henceforth everything relating to the purchase or sale of tires will be conducted through the new organization. As fully three-fourths of the 1911 business already has been written, however, the full effects of the new arrangement will not become apparent until next fall. One of the most immediate steps will be the concentration of the various branch stores which now are separately maintained. In a number of cities there are as many as four of them, and in such places and wherever else more than one branch exists they will be consolidated into one establishment and operated under the corporate title United States Tire Co. Each of these consolidated branches will carry tires made by the four factories concerned. None of the four brands will be sacrificed or pushed to the disadvantage of the other, but there no longer will be such competition between them as has existed.

Engineers Hold Five Long Sessions

Winter Meeting in New York Remarkable for Interest Shown—Membership Shows Steady Growth—Designers and Others Listen to and Discuss Many Papers and Watch the Operation of the Dynamometer at the Automobile Club of America

NEW YORK, Jan. 12—The 2-day winter session of the Society of Automobile Engineers came to a most successful conclusion here tonight after five sessions that were more largely attended than any previous session of the society. At the dinner last evening 311 were present, which sets a high water mark for the society. During the 2 days of the meeting more than a score of new members were taken into the society and application for many more made. So fast has the membership grown during the last year under the efficient general managership of Coker F. Clarkson and President Coffin that it has been difficult to organize a clerical staff to keep apace with the demands of society which has permanent headquarters at 1451 Broadway, which is but one block from Forty-second street and well located with reference to the motor industry which is but a few blocks further north on this well-known street. The present membership is 614 and fifteen applicants were taken during the session.

SOCIETY OF AUTOMOBILE ENGINEERS READING THE DYNAMOMETER AT AUTOMOBILE CLUB OF AMERICA

Sessions of Society

Roughly speaking, the society held six sessions during the 2 days, one in the forenoon, one in the afternoon and an evening session each day. The opening session on Wednesday was given over to the business of the society, the leading point under discussion being the reframing of certain sections of the rules governing the different classes of members and the qualifications of each class.

The following extracts from the constitution show the membership status:

The membership of the society shall consist of honorary members, members, associate members, junior members, affiliate members and international members. Honorary members and members are entitled to vote and hold office. Associate members, junior members, affiliate members and international members shall not be entitled to vote or hold office but shall be entitled to all of the other privileges of membership.

The member grade shall be composed of persons 26 years of age or over who by previous technical training or experience, or by present occupation, are qualified to act as designers or constructors of complete motor vehicles, or of the component parts, or of equipment thereof; or to exercise technical supervision of the production of materials of engineering construction; or to take responsible charge of motor car engineering work; or to impart technical instruction in motor car vehicle construction and operation.

Associate members shall be composed of persons 26 years old or over who are engaged in the motor car or related industries in a responsible manufacturing, commercial or financial capacity, or who are so connected with the motor car and related industries as to be competent to co-operate with motor car engineers.

Junior members are persons under 26 years of age, who shall otherwise be eligible to admission to regular membership.

Affiliate members shall consist of firms or corporations engaged in the manufacture of motor cars, or engaged in the manufacture of parts or accessories used in connection therewith, and shall be represented as required by the constitution.

The council of this society shall have the right to transfer a member from the junior grade to the member grade, or from associate grade to member grade, whenever satisfactory proof is presented to it that said member is qualified for admission to the member grade; such transfer to be made without submitting the name of the applicant for transfer to the voting membership of the society.

The initiation fee for membership in each grade shall be as follows: For member, $25; for associate, $15; for junior, $10; for affiliate, $50. The annual dues shall be: For member, $15; for associate, $10; for junior, $5.

The affiliate member shall have the right to designate personal representation up to a total of six and shall pay annual dues as follows: For one affiliate member representative, $15; and for each additional affiliate member representative up to six, $10.

A junior or associate transferred to the member grade shall upon such transfer pay the difference in initiation fees and thereafter the annual dues for the member grade.

Wednesday afternoon the first professional session began and was largely given over to the reports of the various committees on standardization. During the past year President Coffin has bent every effort to bring about the standardization of many parts entering into the makeup of the car, such as annular ball bearings, frame sections, carbureter features, iron and steel specifications, broaches, lock washers, springs, seamless steel tubing, sheet metals, nomenclature, aluminum and copper alloys and other departments. In order to get this work properly launched Henry Souther was last summer elected general chairman of this standardization committee and appointed subchairman for the different divisions. In the session Chairman Souther made a general report of the progress and the matter covered and then called on the different subchairmen to report the work of their special divisions.

In his general report of the progress made Chairman Souther said: "Your standardization committee has found that it has a terrific task to accomplish, the diversity of the many industries which enter into the makeup of a car being the direct cause of the task. Our program is not a fixed one and cannot be until our work is further analyzed. We gather the different data from the manufacturers by mail. When we take up one line of work, like frame sections, we find out from the different makers and frame makers the depth of frame section, the thickness of stock and the channel width nec-

essary for different car weights and power. By bringing all of this data together it is possible to get some line on where the marks of standardization can be followed. The same course is followed in all the divisions so that the standardization work is largely an outcome of the present practice of the majority of our manufacturers and not any arbitrary system we are trying to force on the makers. This work could be greatly facilitated by the appointment of geographical chairmen throughout the manufacturing territory of the country. There could be a chairman in Cleveland and he would be able to get the different members of his committee together quite frequently. Another chairman could be located in Detroit, one in Indianapolis, one in New England, one in Pennsylvania and others in sections where the density of the industry would make it possible. Standardization is badly needed and it is proven by experience that it is best gathered by correspondence.

"This work has only been going on 6 months, but so much work has been done by the different committees as to give good encouragement for the future. The work is not infallible and discussions are asked for by the different members of the society after the report of each subchairman is given. In order to get as near the truth as possible in this standardization work the consumer and manufacturer have both been placed on the different subcommittees and the net result is frequently a compromise between the two. Where the consumer and producer have not been able to agree as to what is best, future work by larger committees will have to settle."

Iron and Steel Report

The report of this committee was given by Chairman Souther and contained specifications for different steels used in the car. One example will suffice. The report suggested the following specification for a .15 carbon steel:

Carbon	.08 per cent to .18
Manganese	.40 per cent to .60
Silicon, not over	.20 per cent
Phosphorus, not over	.04 per cent
Sulphur, not over	.04 per cent

Similarly suggested specifications were given for .20 carbon steel, .30 carbon steel, .45 carbon steel, .80 carbon steel, .95 carbon steel, .20 carbon and 3½ per cent nickel steel, .30 carbon and 3½ per cent nickel steel, .15 carbon chrome nickel steel, .20 carbon chrome nickel steel, .30 carbon chrome nickel steel, .45 carbon chrome nickel steel, .20 carbon vanadium steel, .30 chrome vanadium steel, .45 carbon chrome vanadium steel, silico-manganese steel, common screw steel and low-alloy steel. In a similar way specifications of materials suitable for valves, steel castings, gray iron castings and malleable iron castings were given.

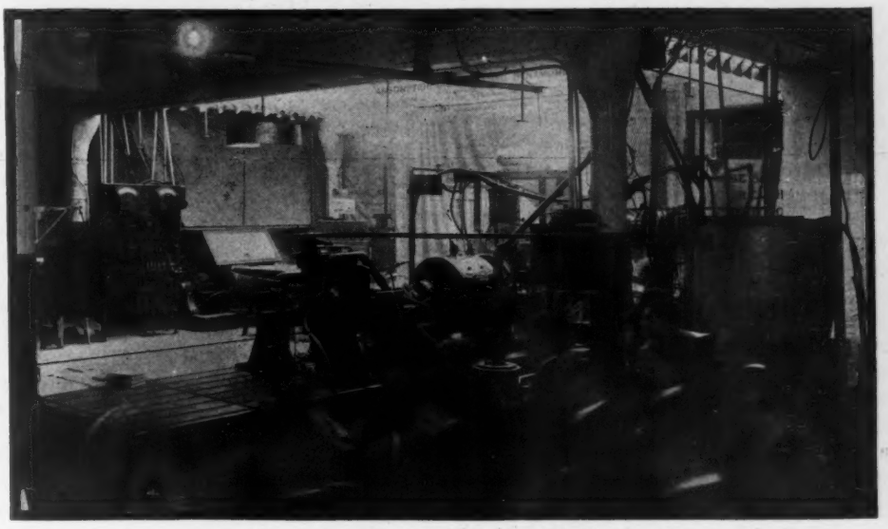
Mr. Souther stated that these specifications were drawn so as to be practical to the ordinary car manufacturer. The metals can be bought at a reasonable price. There are both better and poorer metals than these specified, but the committee feels that if these steels were used and properly heat-treated they will give good results. These are common sense specifications of metals.

Suggestions by Coffin

Mr. Coffin suggested that the committee also should include specifications that would include the higher grades of steel suitable for motor car construction as well as alternate grades of steel that are now on the market and regularly sold for motor car work. These specifications of alternate grades would provide an excellent guide for the use of motor car manufacturers who cannot afford to make analysis of the different lots of steel they buy and companies that cannot afford to maintain metallurgical departments. He also suggested incorporating a series of notations covering the special care required in the heat treatment of these special steels.

A new phase of the standardization of steel, if the expression might be used, was brought out by Mr. Davis who had attended the meeting of the British motor car engineers during the past autumn as the representative of the society. Mr. Davis mentioned the desire on the part of many foreign engineers to require the steel companies to furnish steels that will endure a certain physical test and leave the specifications to the steel man himself, rather than give the steel maker the specifications and cause him to produce steel according to them. The society was split on this question, some of the steel makers' representatives taking one side and some the other. It was, however, general among the steel men that where the physical test was agreed upon the steel men would not sell that way unless the steel was delivered in the form it would be used in, otherwise should the car maker heat-treat it and put it through other treating processes the physical strength would be changed and the steel maker could not be held for changes brought about by the car maker after the steel was delivered to him.

Mr. Souther contended that the physical specifications are not so definite as the chemical ones and that it is easier for the steel maker to get around them. Where chemical specifications are used the car maker can have the steel he buys tested and if it does not come up to these specifications it can be returned to the steel maker. But where the physical specification is used this is altered by forging and heat-treating and so the steel maker would not guarantee his product. He held that with chemical specifications as submitted in the report it would be possible for the purchasing agent to handle them sensibly in making purchases and after purchased, the chemical department could check up the specifications. Mr. Souther contended that to give the chemical specifications of all the alternate steels as desired by Mr. Coffin would be too confusing and would result in the publication of a text book on steel specifications rather than a practical guide to buyers, as the committee had in mind. The work could be done, but it would be confusing rather than beneficial.

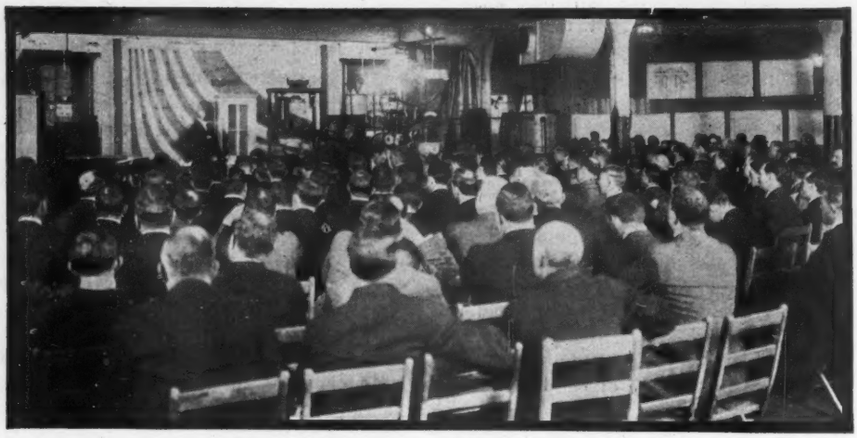


S. A. E. AT A. C. A.—DYNAMOMETER IN BACKGROUND

Steel Men Talk

The Midvale Steel Co.'s representative objected to some of the steel specifications submitted by the committee on the ground that a higher carbon content was needed and should be used. The committee agreed to modify the specifications if others agreed with the criticism.

Another representative of a big steel corporation objected to the chemical specifications submitted in that they failed to give due attention to screw steel which his concern produces. There were many other criticisms launched which proved conclusively that the work of this committee is far from being complete and that before it is completed it will be necessary to impartially survey the entire field of the steel industry and give specifications that give honor where honor is due and



ENGINEERS LISTEN TO DYNAMOMETER TALK.

not preference to any special grades of steel. It is probable that this line work will furnish employment for the committee and sub-committee for some time to come.

When it came to receiving the reports on standardization from the other sub-committees the same storm of criticism resulted in nearly every case, the criticism generally being caused by company representatives who thought the standards or specifications submitted would work to their ill. Wherever the specifications suited them it was all right. Mr. Tuthill thought the specifications were too mandatory and that when a spring maker would go to a maker he would demand springs of the specifications submitted or nothing, whereas the different spring makers had other specifications that would give better results. This evoked the fact that these specifications were not recommended by the society, but only listed as suitable and as such car makers should not mention them as the specifications decided upon and recommended by the society.

Reports of Sub-Committees

The report on the broach sub-committee showed that the members of this committee have obtained from the different car makers the size of the broaches used on different parts of the car. Mr. Davis, of this committee, told of the work General Manager Clarkson has done along this line as well as getting from the makers the limits at present used in this work by the makers.

The report from the seamless steel tube division showed that a year ago one maker was using fifty-six different diameters of steel tubing in two models when not more than ten different sizes would suffice. A little more than a year ago the tube mills had specifications for over 1,500 different sizes of steel tubing from car makers, but that this number has been reduced to fewer than 600 and the opinion prevailed that with standardization carried to its limit the number would be little over fifty. With the number of sizes reduced the tube mills would carry the different sizes in stock, whereas today they are made up on order only and often cost much more and the maker has to wait for his supply. The reduction in the number would bring about a most satisfactory result to producer and consumer.

Report on Frame Sections

The committee on standardization of frame sections recommended that as most of the major units of the motor car, such as motor and gearbox, are fitted to or attached to the frame, that the question of frame design be given first consideration, it being the foundation on which all of the other parts are carried. The recommendation carried with it the thought of doing away with the practice of adapting the frame to the other parts. Economy in frame construction was the basis of the recommendations. It was further recommended that the thickness of the metal be expressed in thousandths of an inch; and that the United States standard gauge be considered the standard for arriving at the gradation of thicknesses. The recommendations further included: That open hearth hot-rolled steel be the standard; that the standard of quality be based on chemical analysis; that a submitted chemical analysis be considered standard; that .125, .156, .187 and .250-inch be considered as standard thicknesses for frame parts; that the punch size, inside dimension, be standard; that 1½ inch shall be the standard width of flanges, measured outside to outside; that center sections of side rails shall be designed in multiples of 2 inches; and that the taper of side rails shall be $\frac{1}{8}$ inch in every inch. The report included many other recommendations in the matter of standardizing frame parts.

Ball and Roller Bearings

D. F. Graham read the report of the ball and roller bearing standardizing division. The report recommended that the sizes adopted by the makers of annular ball bearings for bore, outside diameter and width be accepted as standard and the speaker submitted a table giving these measurements. These measurements can be used for the short-type roller bearing. No attempt was made to standardize the long-type ball or roller bearing. A portion of the report dealt with the tolerance permitted in different sizes of bearings.

The report read on the aluminum and copper alloys contained specifications well suited for the following: Babbit metal, white brass, phosphor-bronze bearing metal, brass casting metal, yellow brass, cast manganese bronze, aluminum alloys, etc. In addition it contained many instructions on these specifications. The report furnishes a most valuable, practical guide work working with these metals.

The other reports on the standardization of parts were not completed, some of the divisions having got their committees together but a few hours previous. It was, however, the general consensus of opinion that this standardization work is the big task before the society, and it will be pushed ahead until the next meeting of the society.

Miscellaneous Papers

In all of the other sessions many topics were discussed and papers read on them. Some of the papers created discussions and others did not. The different papers will be published complete in these pages from week to week.

A most interesting phase of the Wednesday afternoon session was an ignition demonstration in the laboratory of the Automobile Club of America. The test was conducted by Mr. Heins, of the Bosch company, and consisted in showing the relative value of a magneto which sparks in two plugs in a cylinder at the same time as compared with a single plug. The test was conducted on a T-head Chester four-cylinder motor with a G and A ball-valve carbureter. The special magneto used is designated the two-spark type. The magneto is made with two distributors which are synchronized. The armature has its regular two windings, but both ends are taken up and one connected with one distributor and the other with the other. The two distributors are thoroughly insulated from each other. Two spark plugs wired in series are used, one located over the intake valve and the other over the exhaust valve. A spark occurs at each plug at the same instant. The object of the two plugs is that combustion is started simultaneously at two points and consequently the flame has but half as far to travel before combustion is complete, as where one plug is used. The test showed that with one spark and a fixed advance the motor turned over 1,412 revolutions per minute, showing 13.2 horsepower; whereas when the two sparks were used and the spark advance and carbureter adjustment left the same the speed rose to 1,630 revolutions per minute and the horsepower to 23.5. Some of the engineers objected to the test on the ground that the mixture was specially rich and so favorable to the double spark test on the ground that better sparking is needed more with a rich mixture than with a lean one. The carbureter did not admit of adjustment, so the test was postponed until an adjustible carbureter was fitted and

interesting results were obtained. The cylinder sizes were 3 3/16-inch bore and 4½-inch stroke.

Carpenter Tests Air-Cooler

Professor Carpenter read a paper on a test made with Franklin air-cooled motors a year ago. The test was designed to discover which was better, concentric intake and exhaust valves in each cylinder or separate valves. The speaker discovered that with the separate valves there was a higher percentage of mixture admitted to the cylinders and consequently inferred that a separate intake and a separate exhaust valve was preferable to where they are formed concentrically. The paper showed that with separate valves there only was 1 per cent variation in the volumetric efficiency from 750 to 1,500 revolutions per minute. By volumetric efficiency is meant the percenta of the combustion chamber filled with explosive mixture on each suction stroke. This was a most favorable condition, whereas with the concentric valves the efficiency was low at 700 revolutions and best at high speeds.

Springs and Shock Absorbers

In Thursday's session a general discussion was provoked when the matter of springs and shock absorbers came up. All of the shock absorber people were on hand and President Coffin had the greatest difficulty in keeping them from talking the merits of their own particular shock absorbers and discussing shock absorbers in the extract. A. L. Riker precipitated a storm of criticism from the shock absorber representatives when he said: "Shock absorbers are a good thing from the standpoint of the shock absorber maker. I am not strongly impressed with their value as adding to easy riding except in extreme cases. The ideal shock absorber is not yet made. We would like one that would permit us to design a spring to carry either one or fourteen passengers in the car and yet give easy riding under all conditions."

Mr. Foster, speaking for the shock absorber interests, said: "Some cars are made with springs too stiff and you have to put a shock absorber on, but before doing so a couple of leaves have to be taken out of each spring. The shock absorber is intended to take the extra load that would go on these two leaves. The only thing the shock absorber can do is to help out the spring in its work. A rubber bumper should also be used, but a rebound strap is not necessary. Shock absorbers are intended to give easy riding and not to act at all under normal conditions, so that the spring should be designed to take care of the load on good roads and the shock absorber becomes an auxiliary to care for the rough roads and the high speeds. The shock absorber must not interfere with the normal action of the spring.

David Fergusson said his concern used them as regular equipment on cars because they all thought the absorber helped the spring actions. He said that many of their owners frequently returned the cars after 10,000 or 20,000 miles for overhauling and the shock absorbers are often broken off and never were in adjustment.

UNIQUE CONTEST PROPOSED

Des Moines, Ia., Jan. 9—Des Moines and Memphis are going to have a motor contest. Nobody knows as yet just what the contest will be, but Memphis has sent up a challenge and without knowing what it is all about the Iowa motorists have accepted. The challenge from the southern city came from N. C. Perkins, president of the Memphis Automobile Club, in the shape of a night letter telegram, and reads as follows:

"The city of Memphis and its motor club and myself challenge your city of Des Moines and your motor organization and yourself as president to a friendly but frank and fearless comparison of the two organizations, their respective memberships, number and character of cars owned, records of speed and long distance and continuous runs, number of licenses issued in the city or country, all covering any period of 6 months or more sufficient for a fair test of motor statistics in the two towns proportioned to population. Do your city and your club accept the issue?"

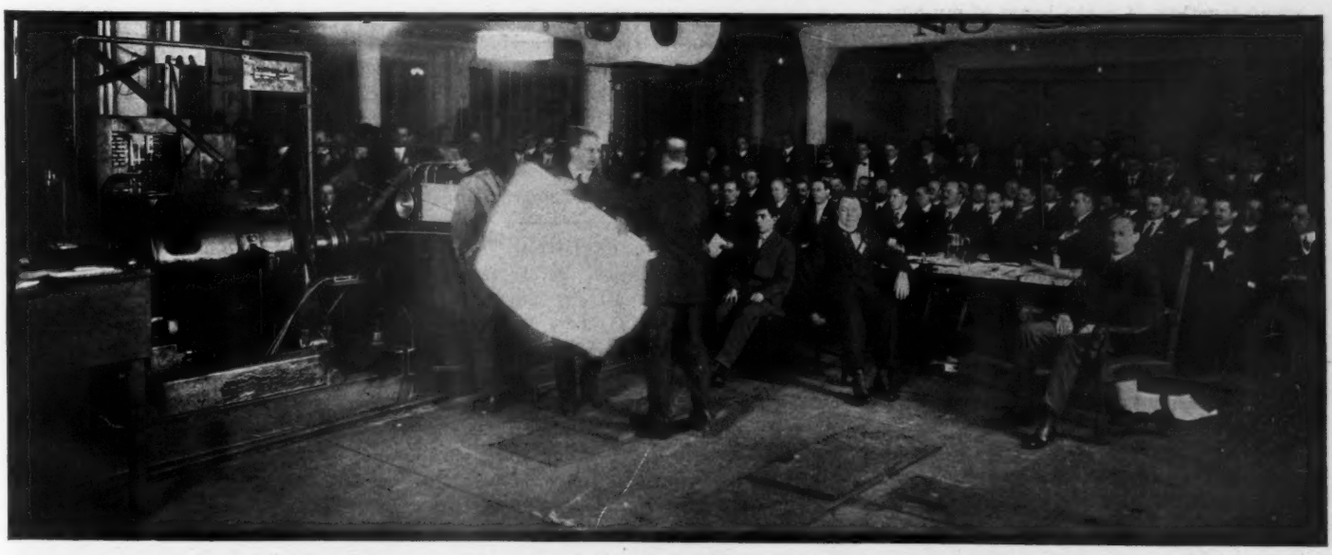
John Gibson, chairman of the motor committee of the Hyperion Field and Motor Club, immediately wired back an acceptance.

DAVENPORT MAKES PLANS

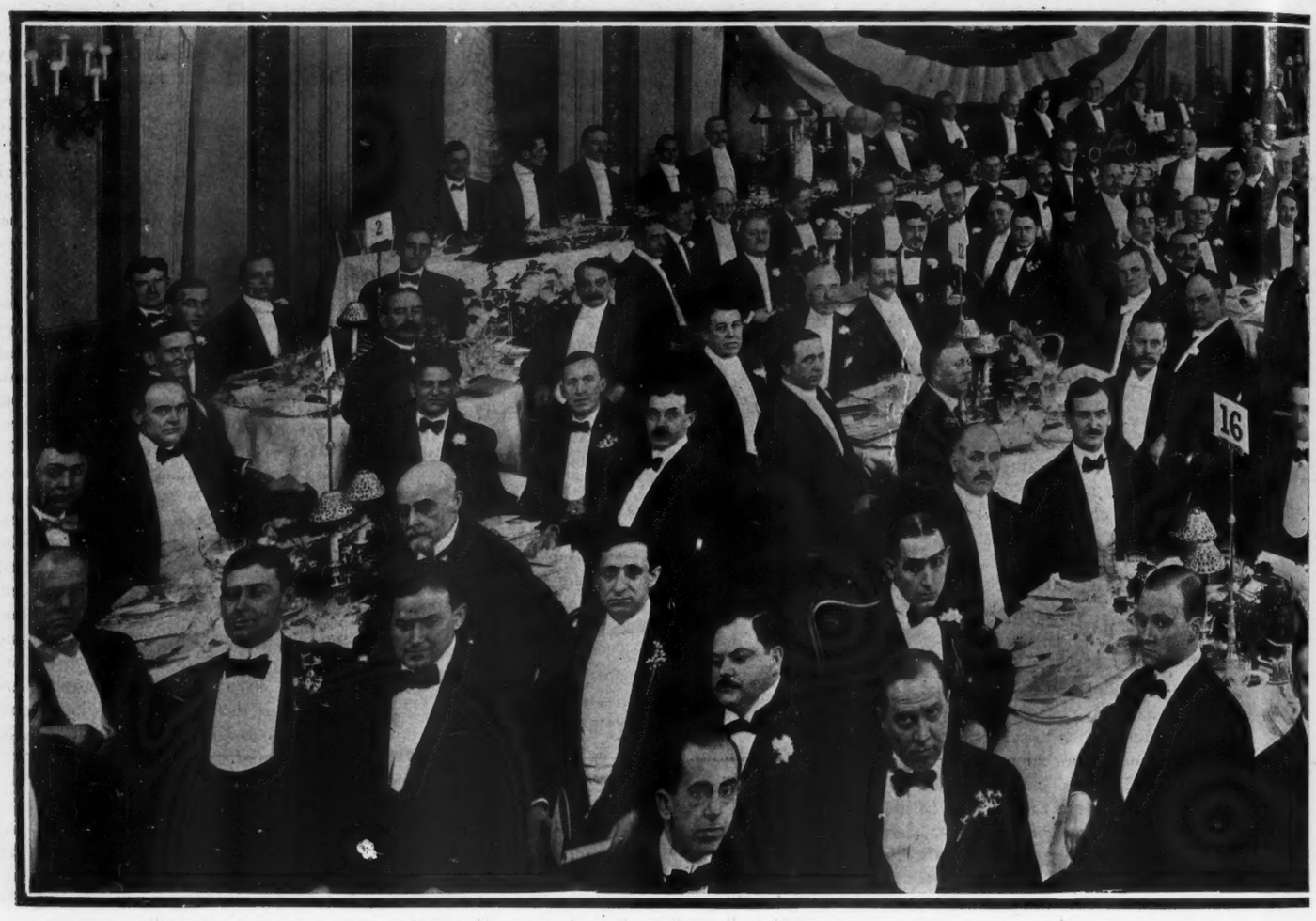
Davenport, Ia., Jan. 15—So productive of good results was the first Davenport show, held in February of last year, that it has been necessary to arange for floor space double that of last season in making the plans for the 1911 exhibition, February 9-12. The show will be held in the Coliseum, and judging from the advance announcements the committee expect that all of the floor space will be taken up. Entries were opened Monday, January 16. The exhibits will be so arranged that ample space for visitors will be provided. Every precaution has been taken against the possibility of fire, and the lighting facilities are likewise much better than last year. Accessory manufacturers are applying for exhibit space this season, and indications are that this class will be well represented.

ST .LOUIS PROSPECTS

St. Louis, Mo., Jan. 15—One of the features of the St. Louis show will be the number and variety of commercial cars to be displayed. Among others will be the new truck of the Stearns, which, it is declared, will be completed just in time to receive its first showing at the St. Louis exhibit. The show has outrivalled the horse show as a society attraction, and many entertainments scheduled for the week of February 13 to 18 have been canceled in order not to conflict. The show committee consists of one member from each concern which has contracted for space.



ENGINEERS TAKING READINGS OF THE DYNAMOMETER AT THE AUTOMOBILE CLUB OF AMERICA



BANQUET OF THE ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS, ONE OF THE FEATURES OF THE SHOW WEEK.

Full Strength of the A. L. A. M. Shown at the

Feature of Occasion Is the Presence of Henry Ford and a Hit Is Scored When Al Reeves and Hero of Patent Suit Smoke Pipe of Peace—Secretary of State of New York Makes Speech

NEW YORK, Jan. 13—"After 7 years of ups and downs during which we have stood shoulder to shoulder, the appellate court has given us an opportunity to share our first victory in defeat and also an opportunity for the entire industry to stand together. It is the honor of my business life that I am given the honor to preside here this evening, to preside over this unified motor car industry; that is an opportunity given to but few; it rings out the old, it rings in the new."

With these stirring words Colonel Clifton cheered to the echo the banquet of the Association of Licensed Motor Car Manufacturers was set moving along in the Hotel Astor here last night. The occasion was rendered doubly important this year, first because of the decision handed down Monday holding that the Selden patent has not been infringed and also because seated at the speakers' table a few chairs to the left of Colonel Clifton was Henry Ford, the hero of the day and the man who brought about the defeat of the Selden forces. Ford had come all the way from Detroit by special invitation of Colonel Clifton, president of the A. L. A. M. It was the first banquet of this association he ever attended and it was with reference to the bringing of the licensed and independent factions of the industry together that the speaker referred to.

The dinner proved to be one of the best of show week and was attended by nearly 250 members of the association and guests. Frank R. Lawrence was toastmaster, and among the speakers were: Edward Lazansky, secretary of state of New York; James Schermerhorn, of Detroit, Mich.; Henry M. Duncan, of the Westchester Appliance Co.; Charles Clifton, president of the A. L. A. M., and M. Jean Paleologue, the well-known artist, familiarly known as "Pal," and who has been responsible for the show posters for years.

In speaking of the motor industry Toastmaster Lawrence said: "The motor car, a thing of yesterday, has in an astoundingly short time conquered the world. There were produced last year 180,000 machines at an approximate cost of $285,000,000, an astounding example of the wealth of this great country. May our imports decrease, may our exports increase; and may the time soon come when the American manufacturer will supply to all mankind."

Secretary of State Lazansky dealt entirely with the motor vehicle situation within the state of New York and the shortcomings of the present law which is being held up as an example to the entire country. Among other points in his address were: "No man should be permitted to pilot a machine unless he is qualified to do it. The New York law is imperfect in this respect in that it requires the chauffeur to pass an examination, but any private owner is excused. All private owners should demonstrate their ability to drive before being licensed.

"I cannot understand why there should be any tax on the sweat of any man's brow. I don't know why chauffeurs should pay a tax to permit them to drive cars. I shall use my influence to have this tax removed by the legislature."

WHICH WAS ATTENDED BY MANY OF THE SELDEN MAKERS AND AT WHICH HENRY FORD WAS GIVEN A GREAT OVATION

Annual Banquet of Selden Association in New York

Toastmaster Lawrence Tells How 180,000 Cars Valued at $285,000,000, Were Made in 1910 and Voices Hope that Prosperity of Industry Will Continue and Europe Be Invaded

One speaker not on the regular program was Mr. Crisp, counsel for Henry Ford in his Selden suit. He was brought along as spokesman for Ford, who could not be enticed to say a word during the entire evening, but who frequently rose and bowed to the repeated cheers of the guests and the requests for a speech.

Mr. Crisp said: "May I not say, my friends, our friends, I have been speaking pretty steadily for Henry Ford for 3 years and he has been paying for it. I have begun to feel like a liquid hydrocarbon engine of the compression type. It is a splendid thing that men who have been engaging in stormy fights in which they think they are right and when the turn of defeat comes to one of them, which must sooner or later come to us all, it is an excellent thing that these men can get together and smoke the pipe of peace."

Just previous to Mr. Crisp taking the floor General Manager Alfred Reeves, of the A. L. A. M., appeared behind the speakers' table with an immense clay pipe which he handed to Henry Ford, both Indian fashion taking a few pulls at it as a burial rite of past differences.

Plans of the Association of Licensed Automobile Manufacturers for the future are outlined in the following statement issued today:

"At a meeting of the Association of Licensed Automobile Manufacturers, held yesterday, it was unanimously voted that as the Selden patent reversal only involved a part of the work of the trade body, and as it is only one of a number of patents controlled by the association, that the organization should continue with its various lines of work, including shows, freight matters, metallurgical work, advancement of mechanical ideas, standardization and similar objects that are of benefit to the whole industry.

"The Selden patent, which the court of appeals last Monday declared valid, but which the opinion stated did not cover the modern gasoline motor car, has only about a year to run before its expiration and has served a very useful purpose during past years in strengthening the trade, bringing about improvements in proper materials for cars, and advancing the experimenting and testing of designs.

"While in the aggregate, the royalties on the Selden patent amounted to a considerable sum, they were comparatively small on each car, members paying last year from $2 to $14, according to the price of the car. Considering the fact that only in a few instances was more than $14 paid on the high-priced cars, it can be readily understood how little effect the reversal of the patent is going to have on general trade conditions. Members of the association paid a net royalty of 8-10 of 1 per cent, but with the refunds in many cases it made the royalty as low as $2 on the low-priced machine and in very few instances more than $14 on the very big cars. Any idea that there can be any change in prices because manufacturers are no longer required to pay royalties is therefore eliminated."

The Manufacturers' Contest Association

Makers Meet in New York and Thoroughly Discuss Rules for the Coming Season Which Are Referred to the American Automobile Association—A Board of Review Is Suggested

NEW YORK, Jan. 13—The annual meeting of the Manufacturers' Contest Association was held today in the room of the Association of Licensed Automobile Manufacturers, the session beginning promptly at 10 o'clock and running without intermission until 6 o'clock this evening. In addition to the election of officers there was a vast amount of business gone over relative to the contest rules for the coming season as well as the discussion of the possibility of a national racing circuit for motoring contests. It was well attended, there being more than a quorum of manufacturers present when President Benjamin Briscoe called the meeting to order, among those present being C. H. Van Dervoort, A. L. Riker, Howard Coffin, E. Rand Hollander, Howard Marmon, H. O. Smith, C. A. Emise, Dr. Wadsworth Warren, George Dickson, S. A. Miles, Alfred Reeves, S. M. Butler, A. R. Pardington, Fred Wagner, F. E. Edwards, George Strout and others.

Election of Officers

The election of officers resulted as follows, there being first five directors elected, from which the officers were elected. The directors elected are: Howard Coffin, Howard Marmon, C. H. Van Dervoort, E. Rand Hollander and C. A. Emise. From this number the following officers were next elected by ballot vote: President, Howard Coffin; vice-president, Howard Marmon; secretary, E. Rand Hollander, and assistant secretary, Russell Field. Howard Marmon was elected chairman of the general rules committee of the organization for the coming year, this committee being selected to suggest revision of the rules to the contest committee of the A. A. A. and co-operate with the latter body whenever necessary.

Board of Review Favored

The association voted favorably on the formation of a board of review of three men not in any wise connected with the motor industry, the object of this board being a final court to which appeals from the decision of the contest board of the A. A. A. can be referred. The membership of the board will not be determined until the next meeting of the association in Chicago in February. It is expected that one representative will be selected from the east, one from the Chicago district and one from California, and that the board will hold meetings once in 3 months or oftener if necessary.

Secretary Field read reports of a mail vote on the Glidden tour for the coming season—is such a tour desirable; if it is desirable, should it be for the Glidden trophy or some other special trophy? The result of the vote was not decisive, many of the makers refusing to vote until something definite was outlined in the matter of rules, etc. It was declared by A. L. Riker that the American Automobile Association being a governing body, it should not conduct the contest itself, but the actual conduct given out to some other organization. One selection was to have the tour start from Washington, D. C., and follow the east coast up through New England into Canada, to Quebec and then return through New York state to New York. The feeling was general that as the west had the tour for the last two seasons, it should be held in the east this year.

Chairman Butler, of the contest board of the A. A. A., suggested that the manufacturers should agree to enter so many cars before the tour would be determined upon in order that it would be a guaranteed success. It costs but little more to run a tour for sixty cars than one of twenty and unless there was a big entry it would not be a satisfactory tour. The matter was left in abeyance until a further canvass by mail be made of the makers.

The matter of recommendations in the contest rules provoked hours of discussion. The first matter to come up was that of the stock car certificate. It was felt that it should be reworded, but in other respects left unchanged. The minimum output of twenty-five cars of any one model must be manufactured before a stock car certification of description will be accepted by the contest board. After these twenty-five have been completed the percentage system of calculating manufacture from July 1 will be continued.

In order to make racing cars safer it

BANQUET OF THE MOTOR ACCESSORIES MANUFACTURERS, HELD DURING THE FIRST WEEK OF THE A. L. A. M.

Elects Howard E. Coffin Its President

Fate of the Glidden Tour Is Undecided—Idea of a National Circuit Takes Well But Action Will Not be Taken Until the Meeting in Chicago—New Form of Car Registration Blanks

was recommended that every racing machine be fitted with proper floor boards, toe boards and dash. Heretofore in many cases the only support the driver has had for his feet has been the pedals, and it was suggested that accidents have in some cases been due to these inadequate facilities.

It was recommended that variations in wheelbase length do not be permitted in stock car models. It is known that some makers list an option in the wheelbase in some of their special models, but this year it will not make any difference whether they do or not. One wheelbase for one model only will be accepted.

A lengthy discussion was provoked on whether wheel diameters should be left optional on stock cars. Some makers argued that it is safer for smaller wheels to be fitted for track work. It was also suggested that they allow of higher speed. The optional wheel was ruled out.

The new form of stock car registration sheet was submitted by Chairman Butler. It is along practically the same lines as that of last year, but more complete in some respects. Much of the material feature has been eliminated. On the other hand more space has been given over to the question of body equipment on all different models.

S. M. Butler, A. R. Pardington and F. J. Wagner were the leading exponents of the national circuit idea in racing. In a word, the circuit idea is to have all of the leading speedway and mile track meets and road races in the country occur in some form of logical sequence, so that conflicting dates do not occur and manufacturers are saved a great deal of expense in railroad fares and time. It was suggested that a special train be secured to carry all of the contesting cars and officials from meet to meet, thereby obtaining theatrical rates. It was suggested to carry a referee, starter, timer and technical committee. The performance of the cars from day to day would be noted.

It was agreed by the manufacturers that it would result in a big saving to them, but they were all of the opinion that there would be too many meets, and that the consequent expense would be enormous. The matter finally was laid over until the Chicago meeting.

SUNDRY MEN MEET

New York, Jan. 16—The Motor and Accessory Manufacturers was very much in dence at the show. In addition to holding the third annual banquet at the Waldorf-Astoria Friday night, the association also held its annual meeting, at which officers for the ensuing year were elected. The banquet was a big success and was attended by more than 400 members of this branch of the industry, while at the eighth annual meeting of the association, which was held the same night and earlier than the banquet, the reports of officers were read and approved. At this meeting four members of the board of directors were chosen to serve 3 years each. H. E. Raymond of the B. F. Goodrich Co., W. S. Gorton of the Standard Welding Co. and C. L. Barnes of the Billings and Spencer Co. were reëlected, while T. J. Wetzel of the Stevens Mfg. Co. was chosen to succeed C. M. Hall of the C. M. Hall Lamp Co. The following morning the officers of the association held a meeting and elected the following: President, H. T. Dunn, Fisk Rubber Co.; first vice-president, C. T. Byrne, Byrne, Kingston & Co.; second vice-president, C. E. Whitney, Whitney Mfg. Co.; third vice-president, C. L. Barnes, Billings & Spencer Co.; treasurer, W. S. Gorten, Standard Welding Co.; secretary, L. M. Wainwright, Diamond Chain and Mfg. Co. William M. Sweet was reëngaged as manager of the association.

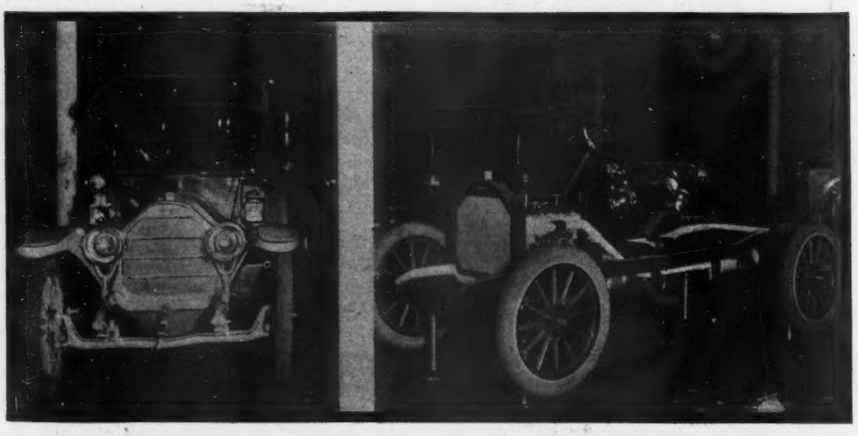
The annual report of H. E. Raymond, the retiring president of the association, which was read at the annual meeting, was a most exhaustive one, the main theme being the show question. The president pointed out what a hardship the show circuit imposed upon the sundry trade and it was stated that this year only three shows are sanctioned by the association—the A. L. A. M. show at New York, the national show at Chicago, and the Boston show. At the present time the membership of the association numbers 232, there having been admitted sixty-one members during the past year, while only three resigned and one was expelled.

SHOW IN NEW YORK, WHICH BROUGHT TOGETHER MANY OF THE PROMINENT FIGURES IN THE TRADE

Display of the A. L. A. M. Pleasure Cars

DISPLAY OF THE E-M-F LINE IN THE GARDEN A COMPREHENSIVE ONE

From an Attendance Standpoint the Show Was the Greatest Ever Held in the Building, While Many Retail Sales Are Reported—One of Features Was Strong Representation of the Dealers Who Brought Customers With Them—Another Year May See a Unified Industry



FULL LINE OF THE HAYNES COMPANY EXHIBITED IN THE BALCONY SHOWED REFINEMENTS MADE IN THE NEW MODELS FOR 1911

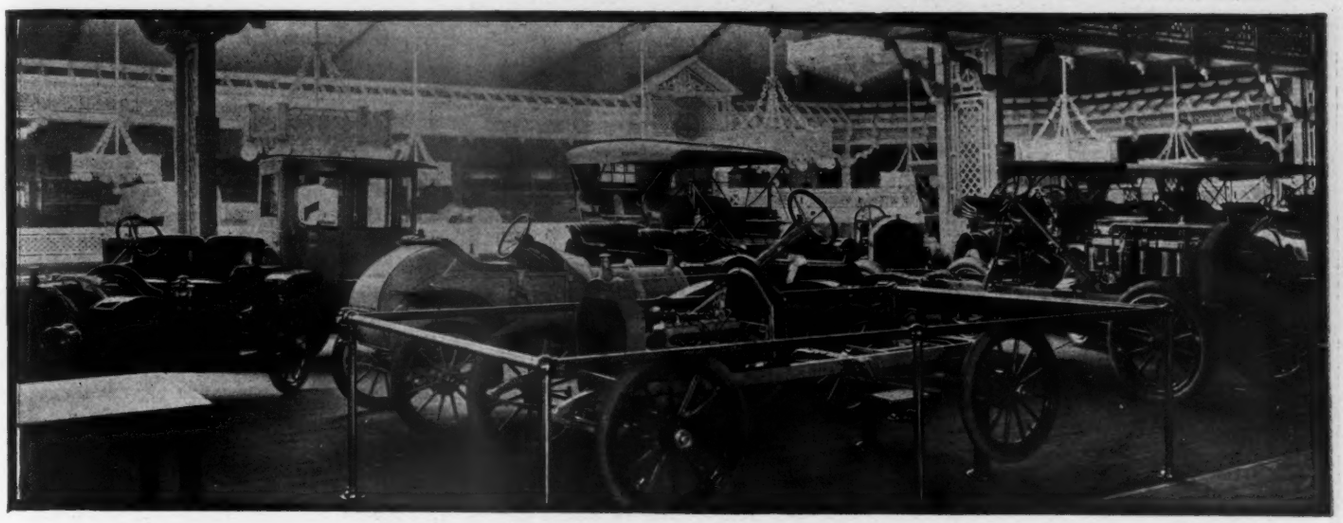
SAMPSON AND BRUSH WERE IN THE SAME BOOTH, EACH CONCERN WITH SEVERAL INTERESTING MODELS FOR NEW YEAR

NEW YORK, Jan. 14—It was in the midst of a noisy Babylon within 1 hour of midnight tonight that the curtain was rung down on what many believe to be the last licensed show in the garden, but by no means the last show of the organization which now carries the name of the A. L. A. M.

Enthusiasm at Close

The closing was a fitting finale to the remarkable business spirit which has shown itself every day throughout the week. As the hands of the big clock moved slowly around to the 11 o'clock position the enthusiasm of the big crowds of visitors and exhibitors could not be restrained. The rule of "No blowing of the horns" was violated about 10:20 and by 11 o'clock pandemonium had broken loose. Every noise-creating factor in the show was brought into use and if the exhibitors would not use them the visitors did. Every horn was sounded, left-over catalogs were tossed confetti-like from the two balconies over the packed aisles on the main floors. As soon as the strains of "Home, Sweet Home," broke forth at 11 o'clock the real end came. The first note had barely reached the farther end of the building when the big Stoddard pullman was being pushed out of the space and into the crowded aisle. In another second two or three stripped chassis were being pushed along. It took but a minute for the crowds to grasp the situation and they occupied the exhibit spaces, leaving the aisles free for the

In the Garden Ends in Big Blaze of Glory



TORPEDO ROADSTER WAS A FEATURE OF HUPMOBILE EXHIBIT

Usual Scenes Incident to Wind Up of the Big Affair Are Witnessed—Horns Are Blown, Catalogs Are Thrown From Balconies and Crowds Assist in General Jubilation—Exhibitors Make a Record-Breaking Getaway and Leave Building Ready for the New Tenants

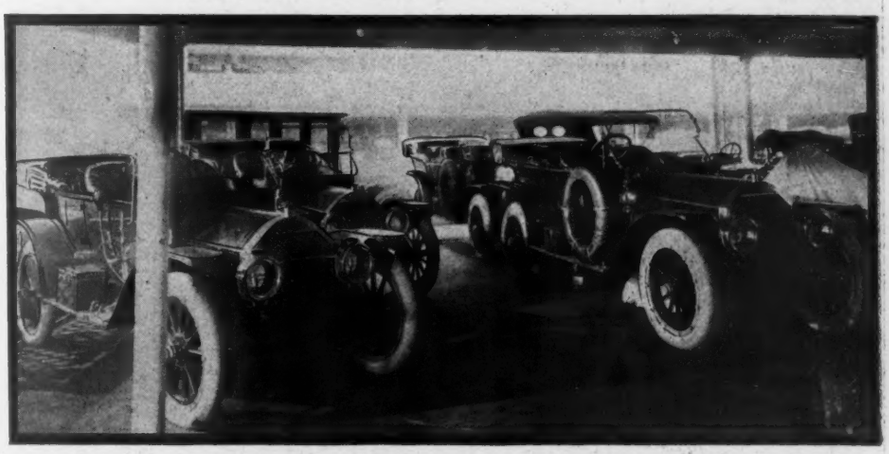
departing exhibitors, who were only too glad to get the room.

In a minute the constant stream of cars was moving out into the drizzle that was falling outside. Before many of the attendants reached Madison avenue the first cars taken from the exhibit space were being pushed in front of the garden where two long lines of trucks were waiting. In a trice the winches were slowly drawing the chassis up onto the horse-drawn wagons, and long before the last stragglers got out many of the exhibits were on their way to the branch or sales-room on North Broadway. It was the quickest getaway New Yorkers ever had seen.

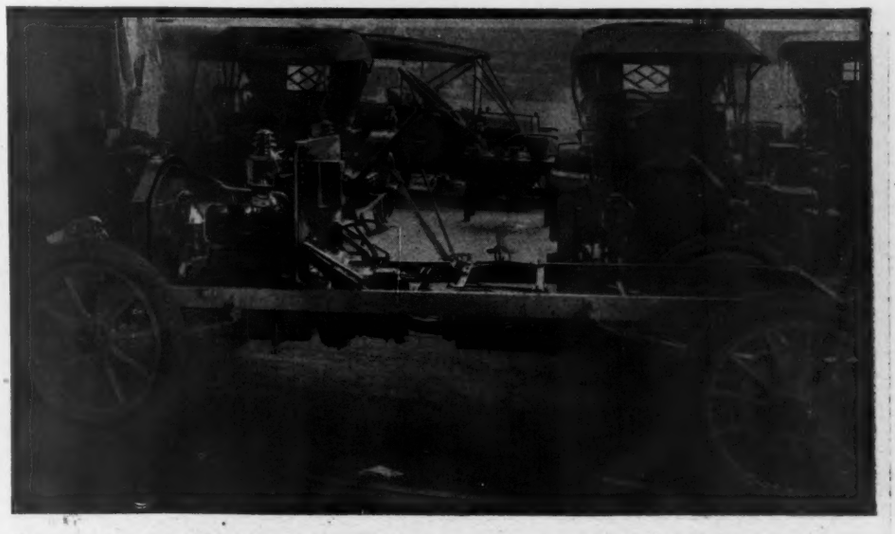
Sundry Men Are Busy

But the hustle was not all among the car men. Those accessory firms that are not staying for next week's commercial show were early on the job. Many of them about 9 o'clock began packing their wares into the large trunks that had been brought into their exhibit spaces and by the closing of the show these trunks were all packed up and locked. Some of the smaller exhibitors were able to carry their goods away in a suitcase, and as soon as the band struck up the closing air they were ready to move off with the crowds.

No sooner were exhibit spaces cleared than the army of show repairmen was set at work. The old green floor covering was taken up, the floors swept and new covering laid, so as to be ready for the giants of the commercial industry, the

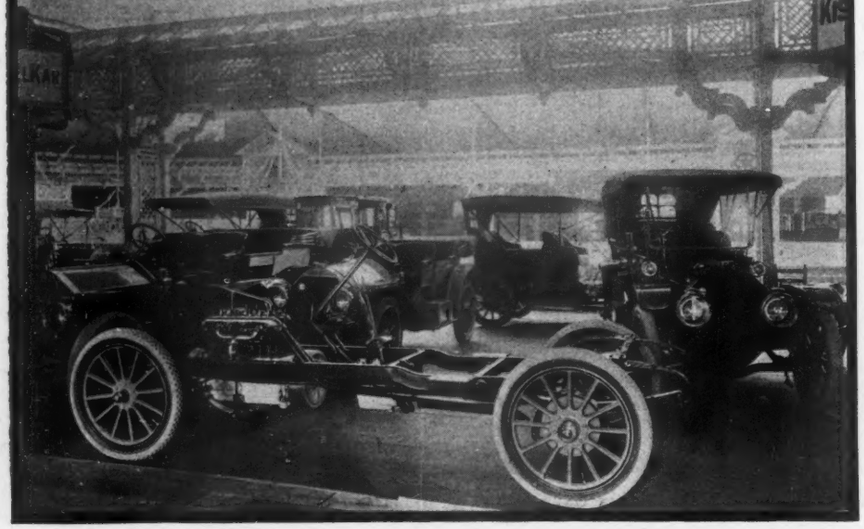


KNOX STAND WAS LOCATED IN ONE OF THE BALCONIES AND THE LINE OF THE SPRINGFIELD CONCERN WAS ON VIEW



POLISHED CHASSIS WAS SHOWN BY THE OHIO IN ADDITION TO SEVERAL MODELS OF EQUIPPED CARS DESIGNED FOR THE 1911 MARKET

Thomas, Kisselkar and the Buick



THOMAS STAND ON MAIN FLOOR OF GARDEN KISSELKAR OCCUPIED AN ADVANTAGEOUS SPOT BUICK HAD A STRONG ARRAY OF NEW MODELS

trucks, which begin moving in Monday morning. In general the scheme of the show will remain unchanged; more than half of the accessory exhibitors are remaining, among these being the tire makers, the carbureter people, the magneto and battery men and those concerns exhibiting raw materials, oils, other lubricants and several of the lamp houses.

Business At the Show

Naturally with everybody the amount of business done during the show is looked for. In a word the business was as good as last year and with many concerns it has been a good deal better. The attendance was in excess of a year ago; there was not a single dull day. From before noon until closing time at 11, the crowds had been there whether it was sunshine or rain outside. Many makers have reported many sales which seem to prove that the period of waiting has passed. The reduction in prices announced by several concerns during the last 3 months has had a procrastinating effect on the industry. Many buyers who would have bought this fall held off, wondering would there not be further cuts made. They are now satisfied after looking all of the cars over that cuts or no cuts they are going to buy certain machines, and they have actually started buying. These retail sales during the show have been made entirely by the New York dealers. All of these dealers report business as having been quiet preceding the show, due directly, as many of them state, to the price-cutting that has been going on.

The Selden decision had a salutary effect on the show and on the buying. Many of the public imagined that because a maker paid a license or royalty to the association that the royalty was so high as to keep the price up, and that once the patent was held as not being infringed the prices would be cut at least the amount of the royalty. These same people were amazed to know that the royalty has only been ¾ of 1 per cent and that a big fraction of this has been returned to the members of the association in the form of dividends. The result is that the royalty is so small as scarcely to amount to anything.

Big Army of Buyers

At every New York show there is a big army of out-of-town dealers who bring many of their prospective buyers along. Whatever sales are made in this way are never heard of, as these dealers have previously made contracts with the manufacturers regarding the number of cars they will take for the year. But the New Yorkers have been on hand in great numbers, and if they have not been buying they have been giving a searching examination and they will undoubtedly be buyers within a month or so. From Canada came a great many visitors, Toronto,

Montreal and Ottawa being the leading cities represented. Many of these were arranging for agents and others came solely as a matter of interest and with the hope of following closely the progress of the industry.

It has been difficult during the show week to determine exactly what phase of the accessory industry has been engrossing the attention of the show visitors most. The crowds always have been around the demountable rim sections. There are nearly a dozen different representatives of this business and all have been busy. The electric lighting fittings for cars have created considerable interests. There are about seven concerns which exhibited electric generators of one form or another and use electric lights. These exhibits have been very complete, the equipment in many cases including voltmeters and ammeters so that the show visitor can see the exact amperage needed for a set of two headlights, two dash lamps and a tail lamp.

Magnetos Interest Many

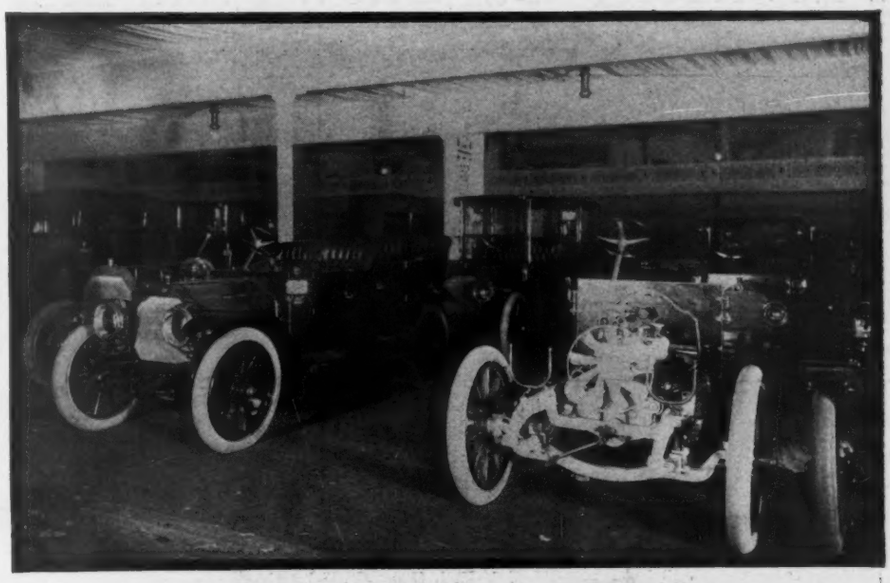
There was as much interest in the magneto section as in any part of the accessory division. All of the magneto exhibitors had large spaces that were well filled with the different magneto types mounted and in operation. Movement always attracts show visitors and it may have been due to the bright sparks and the monster magnetos that the crowds were attracted. The monster Splitdorf and Eisemann magnetos in operation created special interest. The Eisemann type was cut away to show the governor weights used on regulating the sparks on these instruments. The Splitdorf booth showed one of the new high-tension instruments cut in two vertically, showing all of the parts entering into its makeup.

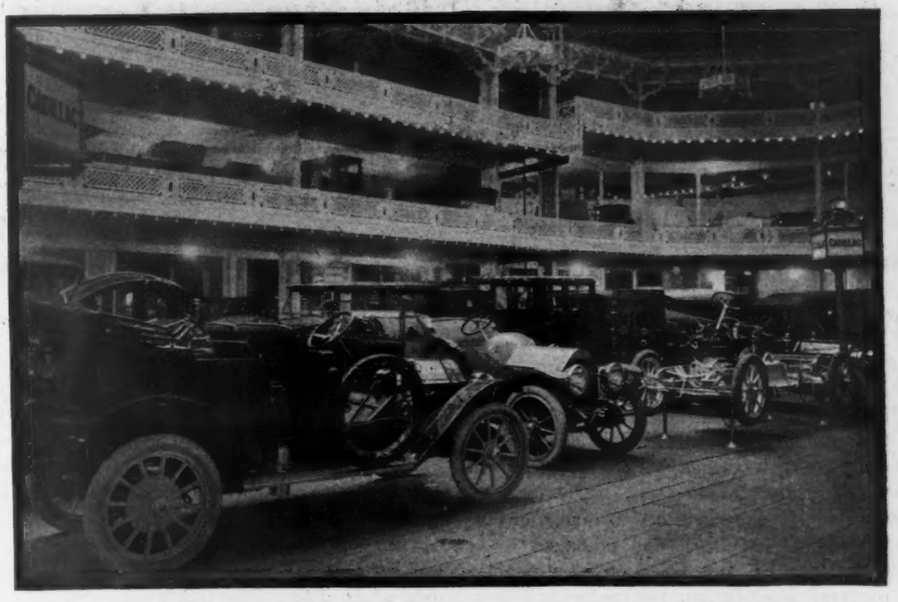
Secretary Downs has not yet given out his official report of the attendance, but estimates it at 45 per cent above that of a year ago. Every day it was over the 23,000 mark, and some days it was far in excess of this. Much speculation was afloat regarding the effect of the Selden decision on the attendance, and now after all is over it is certain that this situation improved the attendance.

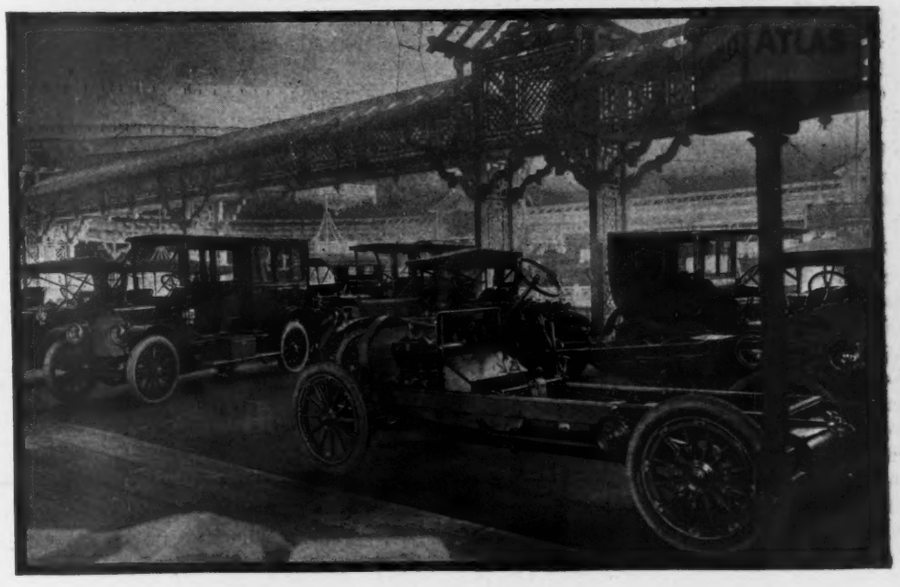
The Selden decision demonstrated the value of unity and organization in any industry, and since the decision was announced, applications have been made for membership into the association. On society days when the general admission was raised to $1, the crowds were almost as large as on regular days.

From morning until night the crowds completely overran the car exhibit spaces and crowded every aisle on both balconies of the garden, the aisles in the concert hall, where accessories were shown, and every aisle in the immense basement, which was entirely devoted to accessories.

Garford, Cadillac and Simplex

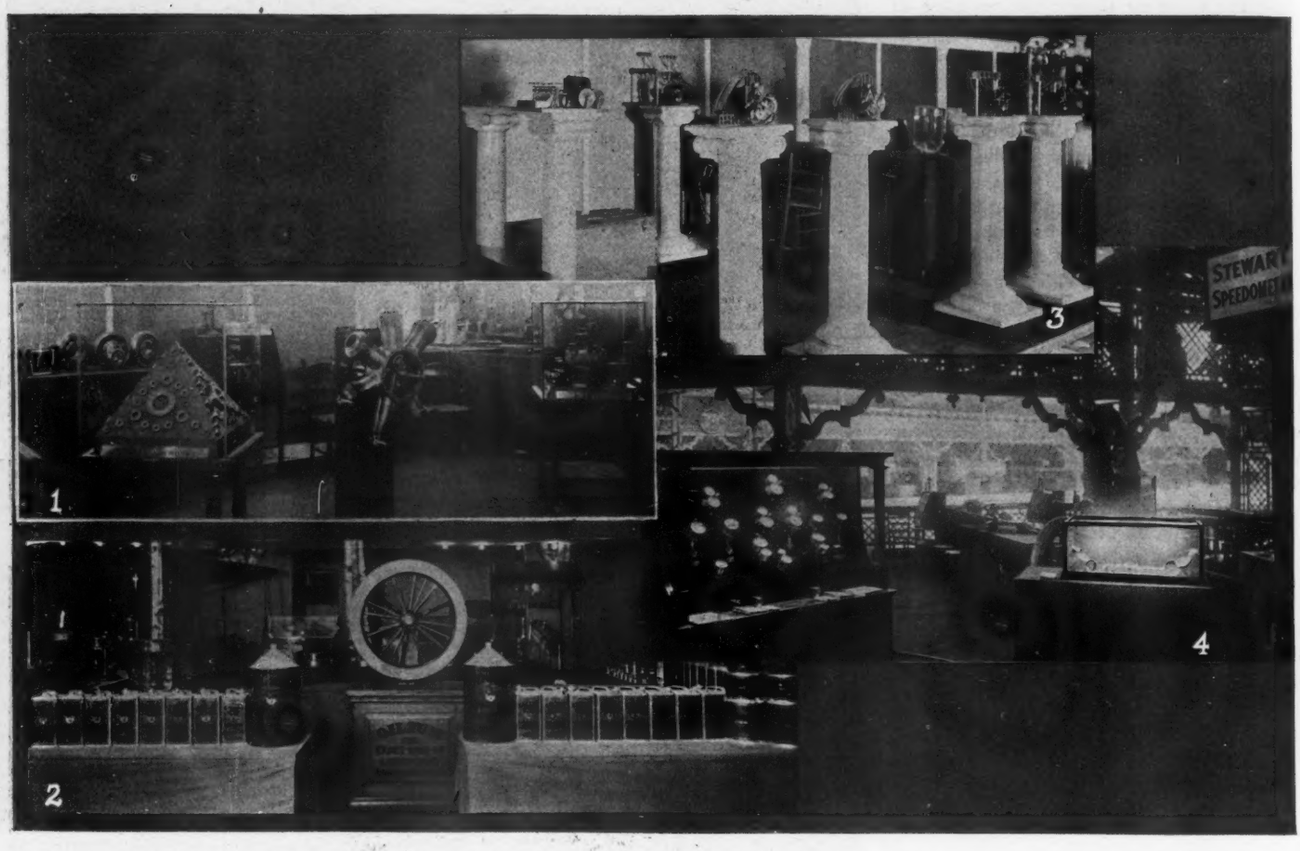






GARFORD HAD AN INTERESTING DISPLAY CADILLAC ONE OF THOSE ON MAIN FLOOR SIMPLEX WAS NEIGHBER TO THE ATLAS

First Motor Car Show Held in St. Paul a Success



ACCESSORY EXHIBITS IN GARDEN SHOW. 1—BRETZ COMPANY'S DISPLAY; 2—THE OILZUM STAND; 3—STEWART SPEEDOMETER EXHIBIT

MINNEAPOLIS, MINN., Jan. 14—With a brilliant display of models awaiting the inspection of motor lovers of the northwest, St. Paul's first show opened in the armory Tuesday afternoon with an attendance of 4,000 people. Boosted by the combined business organizations of St. Paul, and managed by a committee of the St. Paul Automobile Dealers' Association, the show has been played up until it far exceeded the expectations of its supporters. Nearly 150 cars were on the floor, every one a 1911 model. Practically every dealer in the Twin Cities was represented. The exhibition showed every branch of the industry from a motor cycle to a motor truck, including tire exhibits, accessory exhibits and even insurance exhibits.

With its new interior decorations of ivory and gold, the armory was a big surprise. The color scheme was effectively shown off by the addition of eight flaming arc lights to the already brilliant illumination plan of the building. Strings of incandescent lights were added, and as they shot their light on the many colored cars, a picture was formed that is hard to describe. More than $2,000 was expended on the decoration scheme of the armory.

One feature of the show which created much interest was centered in the work of Peter Daley in starting a motor through wireless power. In one corner of the room the wireless switch was turned on. More than 100 feet away Daley stood beside a large car, made the necessary arrangements in his apparatus there and then gazed upon the crowd that watched the starting of the car. The wireless came in for other feats operated by Homer Milton, of St. Paul. The instrument swapped felicitations between the executives of the Twin Cities and carried a message laden with the words of the governor to Duluth. Another feature was the exhibition of the first motor car ever brought to St. Paul, which created no end of interest. It was exhibited by J. George Smith, and manned by a little pickaninny clad in a white suit. It stood next to its descendant, a modern Waverley electric, manufactured in the same factory just 11 years later.

Makes of Cars Shown

Following is a list of the cars exhibited: Buick, Baker electric, Columbia, Chalmers, Cadillac, Cole, Columbus electric, E-M-F, Firestone, Halladay, Hupp-Yeats electric, Locomobile, Marmon, Overland, Oakland, Oldsmobile, Pierce-Arrow, Rauch & Lang electric, Reo, Regal, Rambler, Royal Tourist, Stearns, Thomas Flyer, Velie, Winton; trucks, Avery, Grabowsky, Schurmeier.

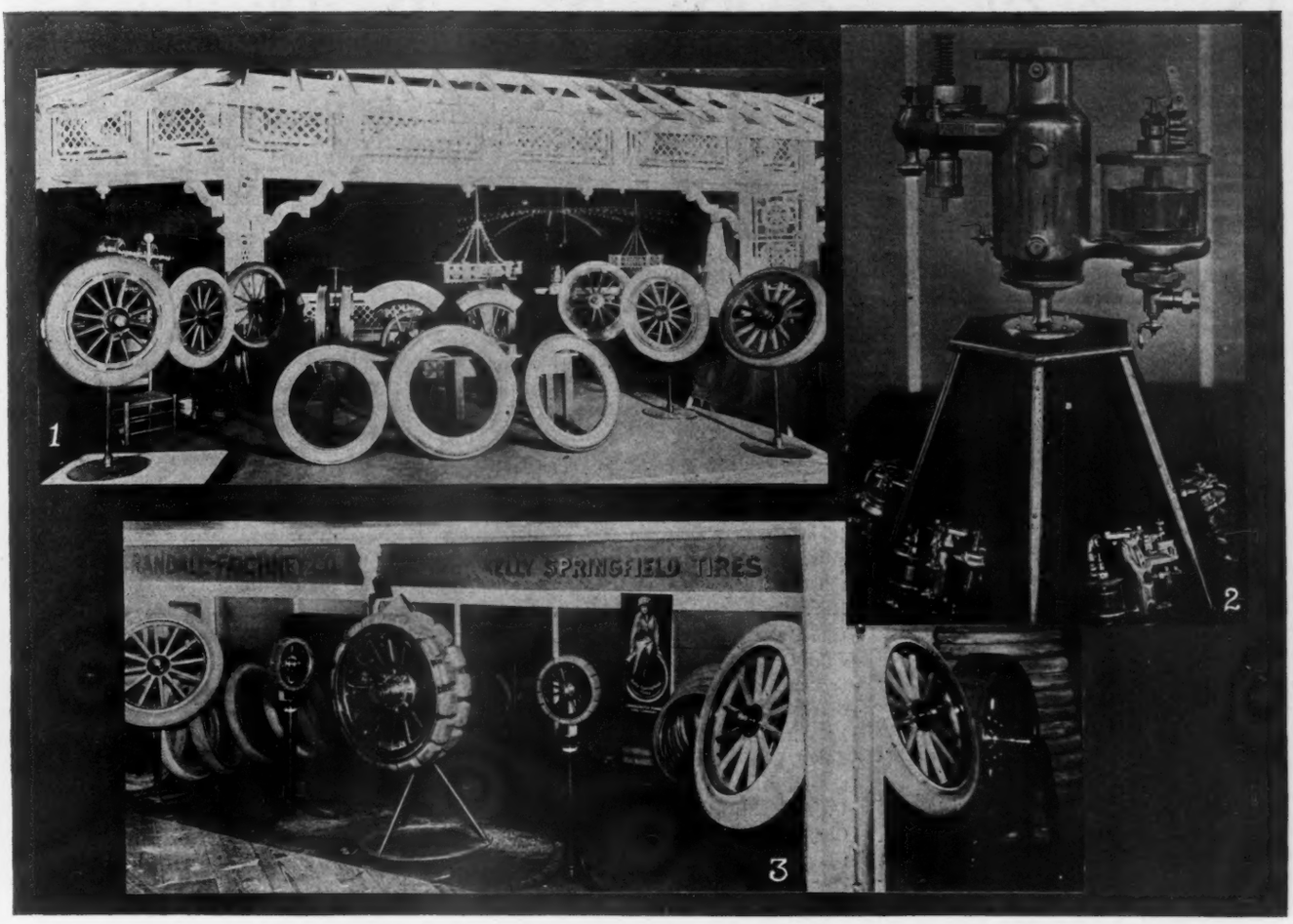
The Heaney Auto Co., of Minneapolis, exhibited five cars, four of them Halladays and one a Whiting. The chassis of a Halladay 40 also was on exhibition, showing the accessibility of all the working parts, and as a special feature there was a multiple-disk clutch, showing the ease with which it can be removed for adjustment.

Four cars, two Hudsons and two Chalmers, were on exhibition by the St. Paul Auto Co. A Hudson crankshaft also was shown, which had a fan blade at one end. This was kept turning by a draft of air from another fan, showing how little power it takes to run the Hudson car.

The White Bear Auto Co. had ten cars on exhibition, among them a Firestone-Columbus, a Premier, an Oakland, a Regal and a Columbus electric. The chassis of a Firestone with all the parts and the rear axle open, was shown. This is said to have been made especially for the New York show, but was diverted from there and brought to St. Paul instead.

Three cars, two Waverley electrics and an Oldsmobile, were exhibited by the St. Paul Motor Vehicle Co., one of them a new four-passenger de luxe coupe.

The Schumeier Wagon Co. exhibited three different models of its trucks, those that are made for the Schumeier & Evans.



ACCESSORY EXHIBITS IN GARDEN SHOW. 1—CONTINENTAL TIRE STAND; 2—GIANT STROMBERG CARBURETER; 3—KELLY-SPRINGFIELD TIRE STAND

the Andrew Schoch Grocery Co. and Holm & Olson, also a special express type car.

The Ideal Auto Co., of St. Paul, had three cars on exhibition; a Cole 30 and a roadster and a five-passenger demi-tonneau touring car. This is the first time the latter has ever been shown in St. Paul. All the models shown are of the fore-door type.

The Electric Carriage and Battery Co., of Minneapolis, showed two cars, the Rauch & Lang electrics. An inclosed chain was shown here for the first time in America, it is claimed.

Two jobs, known as models 30 and 50, were displayed at the show by the Kissel Motor Co.

Of Interest to Farmers

One of the attractions of the show was a machine built for heavy hauling, freighting and for farm work, which was displayed by the Avery Co., of Peoria, Ill. It is equipped with pulleys to be used in running farm machinery, such as corn-shellers or threshers. The Avery company also showed a 3-ton commercial truck.

Two cars were shown by the Central Auto Co. One of these was a Marmon five-passenger touring car. The other was a five-passenger, fore-door Reo car.

The F. B. Stearns Co. had two cars on the floor. One of these, painted a battleship gray, attracted considerable attention. It was a 30-60 toy tonneau, called the Ultimate. The other car was a 15-30 five-passenger touring car.

There were five Buicks in the space of the Pence Auto Co., all of 1911 stock.

The Alco Motor Sales Co. displayed a Baker electric chassis, the only one on the floor of the armory.

Many persons gathered about the space of the Northwestern Cadillac Co. where two cars were shown. One of them was a fore-door model 30 touring car; the other a four-passenger model 30 demi-tonneau of the standard Cadillac type.

The Deere-Webber Co., handling the Velie, had three displays on the floor of the show room, one of which, however, was an assembled motor showing the working parts.

The show means a new era to motoring in St. Paul and while the Minneapolis show, which will be held next month in Minneapolis, will be a much bigger affair from the fact that it will be its fourth annual show, it will boost the industry throughout the whole of the northwest.

WORCESTER CHOSES DATES

Worcester, Mass., Jan. 15—The members of the Worcester Licensed Automobile Dealers' Association are keenly enthusiastic over the prospects for holding a Worcester show. The dates of February 1-4 already have been decided upon. Arrangements also are being completed for special music, the decorative schemes, and some unique and novel display effects in the electrical line. Members of the committee, with Walter L. Weeden, of Worcester, who has been selected to manage the show, were in attendance at the New York show and arranged for special features for the Worcester affair. It is anticipated that all of the local dealers will take part in this show.

WILL LOWER INSURANCE

Indianapolis, Ind., Jan. 15—The Western Association of Fire Underwriters has submitted a proposition to the city of Indianapolis whereby, through making certain improvements, the city can save about $130,000 annually in mercantile fire insurance rates. Among the improvements demanded are the purchase of a motor car squad wagon, a motor hose wagon and a motor ladder truck. The city has just placed in service a motor squad wagon, carrying seven picked men, 250 feet of chemical hose and a 40-gallon chemical tank. This company answers all alarms in a certain territory, the men in the squad assisting wherever needed, and this has led the insurance companies to believe in the motor car.

Detroit Show So Big Two Buildings Are

Packing the Wayne Gardens, the Regal's New Factory Is Used To Care for the Overflow—Many New Models Are Placed on Exhibition and Big Crowds Are Out First Night

DETROIT, MICH., Jan. 17—With the opening last night of the annual show of the Detroit Automobile Dealers' Association, in the Wayne pavilion, and an overflow show under the auspices of the United Automobile Dealers' and Manufacturers' Association, in the new plant of the Regal Motor Car Co., the most notable week in the history of Detroit motordom was ushered in.

Much Space Occupied

In the number and variety of cars shown, both pleasure and commercial vehicles, the combined shows, it is claimed, constitute the greatest display ever seen in this country. There have been larger shows in point of area and in the number of exhibitors, but few have held greater interest for maker, dealer and the public generally. In the combined area of 92,000 square feet, 32,000 at the pavilion and 60,000, and entire floor of the Regal factory, at the United show, no fewer than 318 cars are on view. There are eighty-three exhibitors, including a score of accessory manufacturers and dealers at the United display, the D. A. D. A. show being confined exclusively to cars.

The prospective buyer who cannot find the car he is looking for among this alluring display, comprising all that is newest and best in 1911 designs, must be put down as a hopeless case. Those 318 or more cars represent the finest products of sixty-four factories. Twenty-five of the exhibitors are actual makers of machines, the other manufacturers being represented through their local agencies, of which thirty-two have space in one show or the other.

Both shows are notable for the number of new models shown. Many of them come direct from the New York show, while others are being exhibited here for the first time anywhere. Naturally the fore-door is much in evidence this year. While many manufacturers are skeptical as to the future of this type, still the majority of them, in the effort to give the public what it wants and keep abreast of the procession, are showing one or more fore-door models. Unique in this class is the Herreshoff three-passenger roadster, at the United show. The same company is exhibiting a five-passenger fore-door touring car. About the only thing in the way of freak cars at either show is the Wagenhals three-wheel delivery car at the overflow. The Krit Motor Car Co. is showing the only underslung runabout at the D. A. D. A. exhibition, while the Regal Motor Car Co. displays its low-priced underslung roadster.

Decorations Are Artistic

From an artistic standpoint this year's D. A. D. A. show is a triumph. Nothing like it has ever been seen in Detroit before, and it is doubtful whether even New York had anything on Detroit in the way of decorations. It is easy for the visitor, as he wanders down the broad aisles, to imagine himself transported to some enchanted fairy land. The upper floor, through the genius of the decorator, has been converted into a gigantic rose bower. Countless hundreds of yards of white bunting, torn into strips of uniform width, were employed to give the walls and ceiling a lattice effect. Intertwined among the lattice work are thousands of artificial American Beauty roses and carloads of smilax. The roof of this rose-covered bower is in the form of a half circle, conforming to the roof of the pavilion. In the intervening space are hundreds of red and green incandescent lights which constantly flash on and off by automatic switches, giving the effect of twinkling stars as viewed through the foliage. In the center of the upper floor a fountain plays constantly, adding another refreshing touch to the general effect.

The exhibits are ranged along the side walls. There are no railings or posts to separate one from another this year as heretofore. Space was too precious for one thing, and for another, the use of such obstructions interfered with the decorative scheme and jarred on the artistic sense of the designer, Hugo V. Buelow. But these little details are not missed;

WAYNE PAVILION IS REMARKABLE FOR THE TASTY DECORATIONS WHICH BRING FORTH GREAT PRAISE

Needed To Care for All the Exhibitors

Cars that Were Not in Either of the New York Affairs Are Shown to Enthusiastic Michiganders—Strong Representation of Commercial Vehicles Is Made—Many Sundry Exhibits

in fact, their absence seems rather to make for a better effect. The various exhibits are designated by neat panels done in green, white and gold, displayed directly above the respective booths, an artificial gallery on either side serving as a common roof for all.

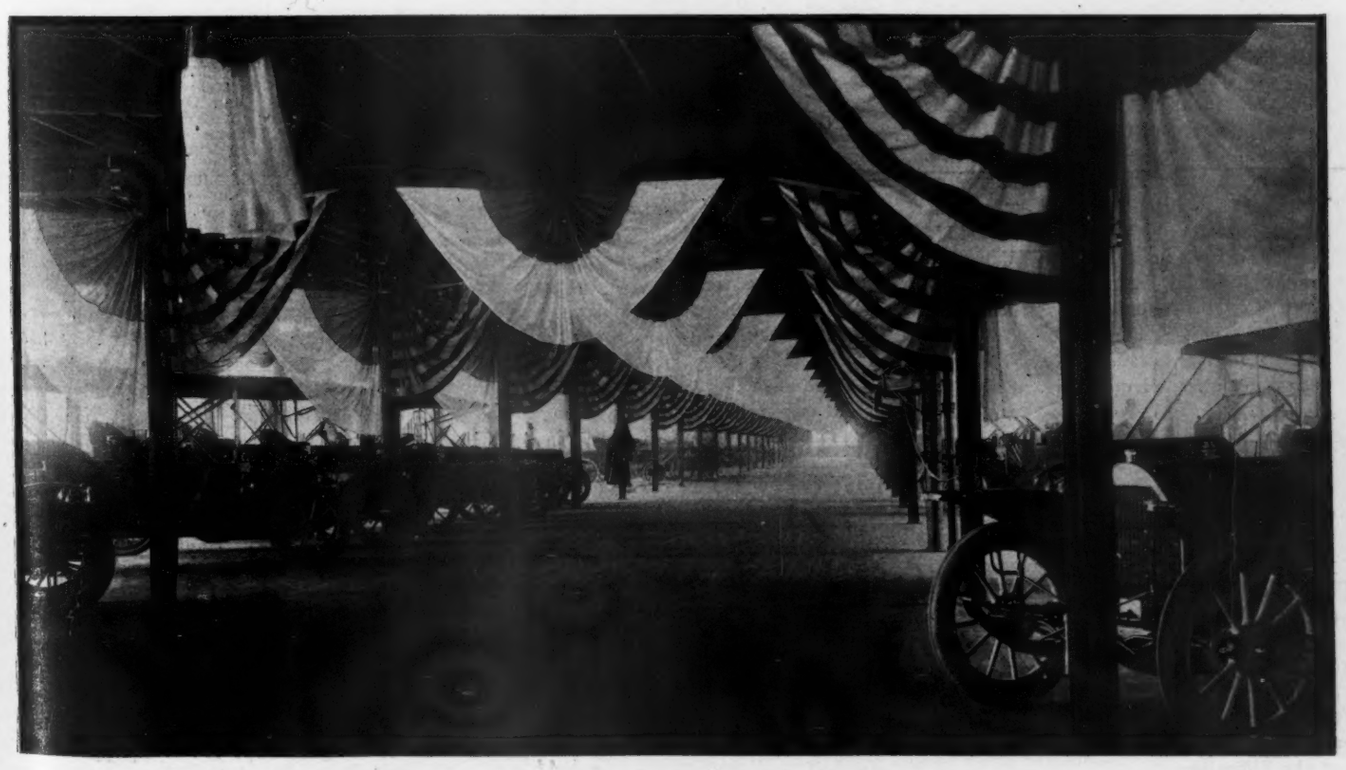
On the ground or main floor the same general effect has been employed, except, of course, for the arched ceiling. All exposed girders and supporting posts have been concealed by wooden lattice work, which, as on the upper floor, is embellished with roses and greenery. The original space available for display purposes, 29,000 square feet, has been stretched into 32,000 by knocking out a partition at one end of the long hall, on the lower floor, and also by building a temporary annex in the rear of some of the exhibit spaces. Every inch of room has been utilized as far as possible without discommoding the visiting public and it is a show in every respect worth while. Here are displayed the latest models of practically all the Detroit makers and many from outside the city, both licensed and unlicensed, for the D. A. D. A. makes no distinction. Licensed and unlicensed cars are displayed side by side in some instances, and the public will have the fullest opportunity to pass judgment on their merits.

The opening of the show last night was most auspicious. When Manager Walter Wilmot gave the word to let down the bars, there was a ready response from the waiting public, eager to see the magnificent spectacle for which its curiosity had been whetted by the glowing advance descriptions in the local press. The public was not disappointed. It was the general opinion that the decorations alone were well worth the admission fee of 50 cents, to say nothing of the exhibits.

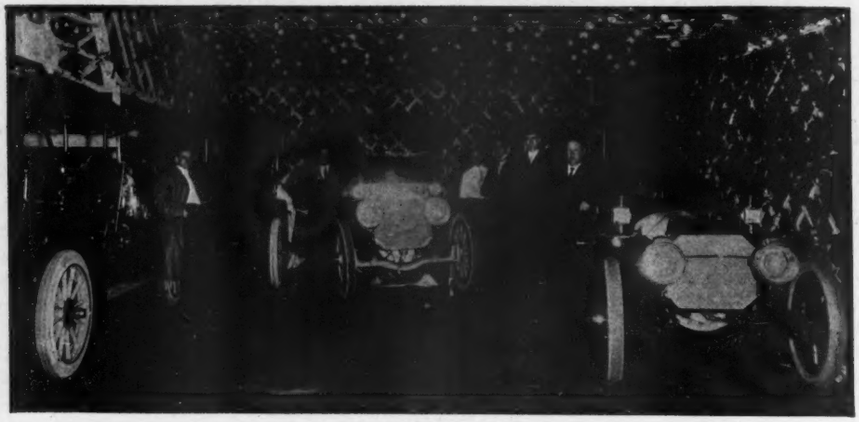
Big Crowds Are Out

From the early indications, all local attendance records will be broken this week. The advance sale of tickets was 50 per cent larger than last year. There were no formalities attending the opening, no speechmaking whatever. The public simply walked in and the big show was on. Thursday evening has been set apart as Society night, and Detroit's 400 are expected to be out in force. There is every reason to expect that the proportion of visitors from outside will be large from the mere fact that it is the Detroit show. Every incoming train brings its delegation of dealers and makers from east, west and south, all eager to see what the hub of the industry has to offer in the way of new models.

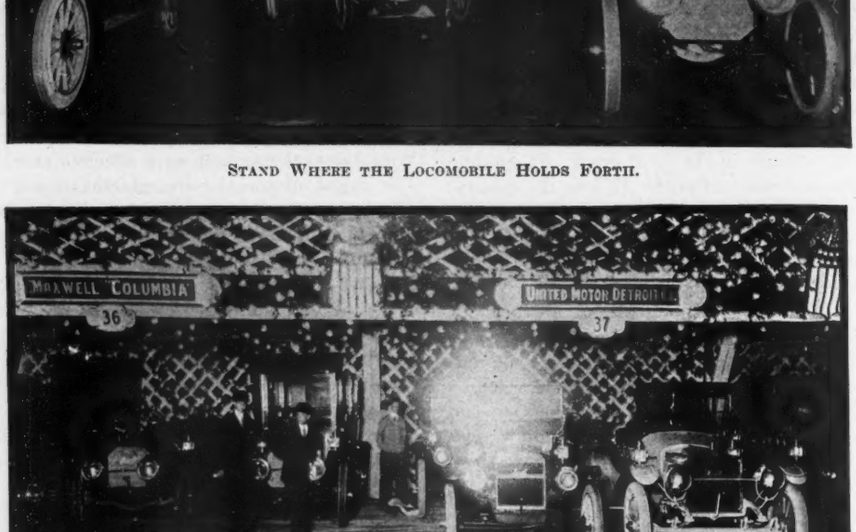
The overflow show was a godsend to the accessory men. There were no accommodations for them in the pavilion, as the space available was not nearly sufficient to take care of those who had cars to display. It was only 10 days ago that the dealers and makers unable to find space in the main show banded together under the style of the United Automobile Dealers' and Manufacturers' Association and decided to give an exhibition of their own, incidentally giving the accessory men a chance. Little time remained, but in that brief interval wonders were accomplished. The Regal Motor Car Co. graciously tendered the use of one of the floors of a recently completed factory building, the machinery not having been installed, and this, with its 60,000 square feet of floor space, proved more than ample for the requirements of the occasion. In the limited time at hand, the promoters of the show could not go in for elaborate decorations, but the show room has been prettily adorned with red, white and blue bunting, artistically draped around the posts and hanging between the exhibits. Uniform signs, conspicuously posted, enlighten the visitor. An orchestra has been engaged for the entire week and the Pontchartrain Hotel Co. will cater. Two car lines afford easy access to the factory and many of the exhibitors are providing cars for the transportation of their invited guests. The opening, Monday night, was well attended and the show promises to be a success. Cars shown in the overflow show included the Whiting, Oakland, Day Utility, Herre-



THOSE WHO COULD NOT GET IN WAYNE PAVILION ARE IN THE REGAL BUILDING



STAND WHERE THE LOCOMOBILE HOLDS FORTH.



HEADQUARTERS OF THE UNITED STATES MOTORS.

schoff, Overland, Woods electric, Paterson, American, Cavac, International, Imperial, Cole, Paige-Detroit, Carhartt, Gramm motor truck, Grabowsky, Wagenhal's three-wheeler and Regal.

Cars shown in Wayne Garden are of the following makes: Overland, Garford, E-M-F, Flanders, Buick, Welch-Detroit, Packard, Jackson, Warren-Detroit, Locomobile, Stevens-Duryea, Alco, Auburn, Hudson, Brush, Sampson, Everitt, Winton, Cadillac, Lozier, Federal, Chalmers, Amplex, Krit, Hupp-Yeats, Thomas, Reo, Rapid, Cutting, Pierce-Arrow, Stoddard-Dayton, Rauch-Lang, Alpena, Van Dyke, Phipps-Grinnell, Cartercar, Evans, Imperial, Maxwell, Columbia, Oldsmobile, Marmon, Haynes, Abbot-Detroit, Mitchell, Detroit electric, Lion, Elmore, Ford, Waverley electric, Hupmobile, Seitz and Sibley.

There is a strong representation of commercial vehicles at both shows. Between the two the visitor will have plenty of opportunity to see what great advances have been made along this line in the past year both in Detroit and elsewhere. There is no conflict between the management of the two shows. The officers of the Detroit Automobile Dealers' Association regret exceedingly that there was not room for all under one roof and express themselves as pleased that the disappointed dealers and makers were able to find a way out of the difficulty.

The fact that there is no building in Detroit large enough to shelter a display that will fully represent the local motor industry tells its own story. It shows, first of all, the wonderful transformation that has taken place in industrial Detroit in the last decade. In 1899 the motor car was practically unknown here except as a curiosity. In that year the Olds Motor Works moved from Lansing and began manufacturing operations in what would now be considered a small plant on Jefferson avenue. The Cadillac and the Ford companies sprang into existence in 1901, and in 1903 came the Packard, all starting business in a small way. In those days Detroit was known principally as a center for the manufacture of stoves and drugs. From 1904 on the motor industry began to forge ahead by leaps and bounds. Today it not only takes first rank among Detroit manufacturing interests, but it has grown to such proportions that Detroit is recognized everywhere as the undisputed motor center of the universe, while, in the list of local industries, stoves now rank seventh and drugs third.

Detroit's Manufacturing Strength

There are now in Detroit nineteen companies engaged in manufacturing and marketing gasoline pleasure cars, three companies manufacturing electric pleasure vehicles and fifteen manufacturing commercial cars. These are not all separate concerns, however, as some of them manufacture both pleasure and commercial cars. Allowing for the duplications, there are thirty-one individual corporations. The combined capital of these companies is $35,500,000. They employed, during the greater part of 1910, 27,200 men and turned out 114,100 cars valued at $134,600,000—catalog prices—as against 45,500 cars valued at $54,300,000 in 1909. These figures are based on confidential information furnished the Detroit board of commerce and are regarded as absolutely reliable. The capital now invested is more than double the total investment of $15,200,000 in 1909, as will be noted, while the number of men employed in 1909 was 16,000 as compared with the figures given above, 27,200. In addition to the car manufacturing concerns, there are more than forty companies whose principal business is the making of motor car parts and accessories. The estimated output for 1911 is conservatively placed at 142,600 cars, pleasure and commercial, representing a total value of nearly $150,000,000.

Detroit's Trade Roster

The roster of Detroit's motor car manufacturers, as it now stands, with the estimated output of each for the present year, is as follows:

Abbott Motor Co., 2,500 cars, $4,000,000; Brush Runabout Co., 9,500 cars, $5,000,000; Cadillac Motor Car Co., 11,250, $11,375,000; Carhartt Auto Corporation, 300, $750,000; Chalmers Motor Car Co., 5,000; $9,000,000; E-M-F Co., 36,000, $28,800,000; Ford Motor Co., 30,000, $22,000,000; Herreschoff Motor Co., 1,200, $1,200,000; Hudson Motor Car Co., 5,000, $6,500,000; Hupp Motor Car Co., 7,500, $5,000,000; Krit Motor Car Co. (figures not available); Packard Motor Car Co. (not prepared to announce figures); Regal Motor Car Co., 8,000; $9,600,000; Welch Co. of Detroit, 600, $1,800,000; Warren Motor Co., 1,500, $1,950,000; Sibley Motor Car Co., 1,500, $1,725,000; Paige-Detroit Motor Car Co., 3,000, $2,700,000; Anderson Electric Carriage Co., 1,400, $3,500,000; Metzger Motor Car Co., 4,000, $2,225,000; Lozier Motor Co. (figures not available); Hupp-Yeats Electric Car Co., 500, $875,000; Phipps-Grinnell Auto Co., 200, $525,000. Commercial cars—Carhartt Auto Corporation, 50, $125,000; Grabowsky Power Wagon Co., 1,200, $2,760,000; Herreschoff Motor Co., 300, $300,000; Alden Sampson Co., 2,500, $4,250,000; Van Dyke Motor Car Co., 3,500, $2,975,000; Warren Motor Co., 500, $650,000; Sietz Motor Co., 400, $1,000,000; Anderson Electric Carriage Co., 1,000, $2,400,000; Oliver Motor Car Co., 400, $785,000; Universal Truck Co., 1,000; $3,000,000; Beyster-Detroit Motor Car Co., 500, $625,000; Metzger Motor Car Co., 1,250, $2,750,000; Phipps-Grinnell Auto Co., 50, $132,000; Federal Motor Truck Co., 500, $1,100,000; Superior Motor Car Co., 500, $750,000.

New Cars at the Shows

Eight cars are shown here which never have been on exhibition before. All of them are manufactured in Detroit and they comprise six commercial vehicles and two pleasure cars. The Cavac and Sibley are the pleasure representatives, while the newcomers in the commercial line are the Day Utility, Federal, Ideal, Quadru, Superior and Wagenhals.

The Day Utility, manufactured by the Day Automobile Co., is a practical car for the grocer, plumber, contractor, manufacturer or farmer, who wants a car for use in business as well as for pleasure. Both seats of the body are detachable, being fastened by a patent locking device. It is made in two models which are identical in design except one is equipped with a 33-horsepower motor, has a 110-inch

wheelbase, body platform space of 36 by 94 inches, and 34 by 3½-inch tires all around. The other has a 21-horsepower motor, carrying space 34 by 84 inches, and 32 by 3-inch tires in front and 32 by 3½-inch tires in the rear, pneumatic tires being employed. The mechanical features of these cars are a four-cylinder—four-cycle motor, equipped with a single high-tension magneto ignition system, and with splash lubrication and thermo-syphon cooling. The flywheel is at the front end of the motor. In unit with the motor, which is on an incline to bring about a straight-line drive, is the clutch and gearset and the whole unit is supported at three points. The gearset is a three-speed selective type and drive to the wheels is by means of a propellor shaft is a torsion tube with a single enclosed universal joint at its forward end. The rear axle is a semi-floating type and an I-beam front axle is employed. Brakes are of the internal and external design acting on the rear wheel drums; and the frame is of pressed channel steel construction mounted on semi-elliptic springs.

The Cavac

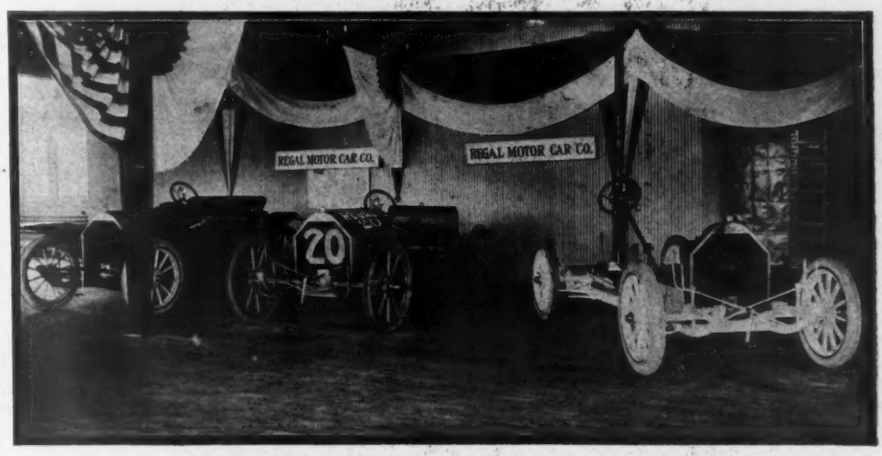
The Cavac car, made by the Small Motor Car Co., is a roadster with 34-inch wheels, 100-inch wheelbase, built on racy lines and has a low center of gravity. Its predominating mechanical features are an underhung frame, left-hand control, a unit power plant with combined clutch and gearset, and shaft drive. The motor has four vertical cylinders cast in pairs with the valves in the head operated by rocker arms and long pushrods from a single camshaft within the crankcase. The cylinder bore and stroke are 3½ by 4 inches respectively. Cooling of the motor is by means of water with a vertical flat tube radiator, a patent eccentric pump so designed as to permit of thermo-syphon circulation in case of accident to the pump-driving mechanism, and an adjustable belt-driven fan. Ignition is by means of a dual system with a low-tension magneto, induction coil on the dash, and dry cells. Lubrication is by means of a circulation system in which oil is forced direct to each cylinder and the three main bearings of the crankshaft. The lower division of the bottom part of the crankcase forms the reservoir for the oiling system. The flywheel of the motor is enclosed in the clutch casing and the clutch casing is integrel with the gearset housing but partitioned off so that the grease of the gearset is not admitted to the clutch housing. The clutch is a multiple-disk design and the gearset a sliding gear selective type, giving three forward speeds and reverse. Three-point suspension is the feature of this power and transmission unit. A single spade universal joint is employed between the gearset and the prepellor shaft. The rear axle is a semi-floating type and Hotchkiss drive through springs is employed. The frame is of pressed channel section suspended from semi elliptic springs. A worm and worm wheel steering mechanism is employed with an adjustable steering column, and with the connecting links above and behind the front axle. Brakes are of the internal and external type, acting on the rear wheel drums. An I-beam front axle is employed with adjustable ball bearings for the front wheels. Hyatt roller bearings are employed in the rear axle, and annular ball bearings for the gearset and propellor shaft. The body equipment comprises either an open or fore-door two-passenger roadster design.

Federal Motor Trucks

The Federal motor trucks, made by the Federal Motor Truck Co., of Detroit, have a single chassis design which is equipped with standard body types. The standard bodies include an open express, an open stake delivery, and a full panel enclosed design. The characteristic features of the chassis are a four-cylinder—four-cycle—water-cooled motor, with cylinders of L-head design and 4¼ by 4½-inch bore and stroke respectively, and single high tension ignition, a circulating oiling system, and forced water circulation are motor features. A leather-faced cone clutch transmits the power to a selective sliding gearset giving three forward speeds and reverse. The housing of the bevel gear and differential mechanism of the jackshaft is bolted in unit with the gear-case, and three-point suspension is a feature of the unit thus formed. Drive from the jackshaft to the rear wheels is by means of double side chains. The frame is of pressed steel of deep and wide channel section, and it is mounted on semi-elliptic springs, front and rear. An I-beam front axle is used and the rear axle is a solid square forging. The steering gear is a worm and worm wheel type, located on the left side as are the rest of the control mechanisms; both the gear-shifting and emergency brake levers are on the outside of the left side frame member. Otherwise control is conventional with pedals for operating the clutch and service brakes, and spark and throttle levers over the steering wheel. The brakes are of the internal expanding type, one set acting on drums secured to the ends of the jackshaft, and the other set on the rear wheel drums. Wheels are equipped with 36 by 3½-inch solid rubber tires, the wheelbase is 110 inches, and a standard 56-inch tread is employed. Timken roller bearings are used throughout the transmission and running gear. The carrying capacity of the chassis is 1 ton, it weights 3,200 pounds, and it has a speed of 15 miles an hour.

Ideal Trucks

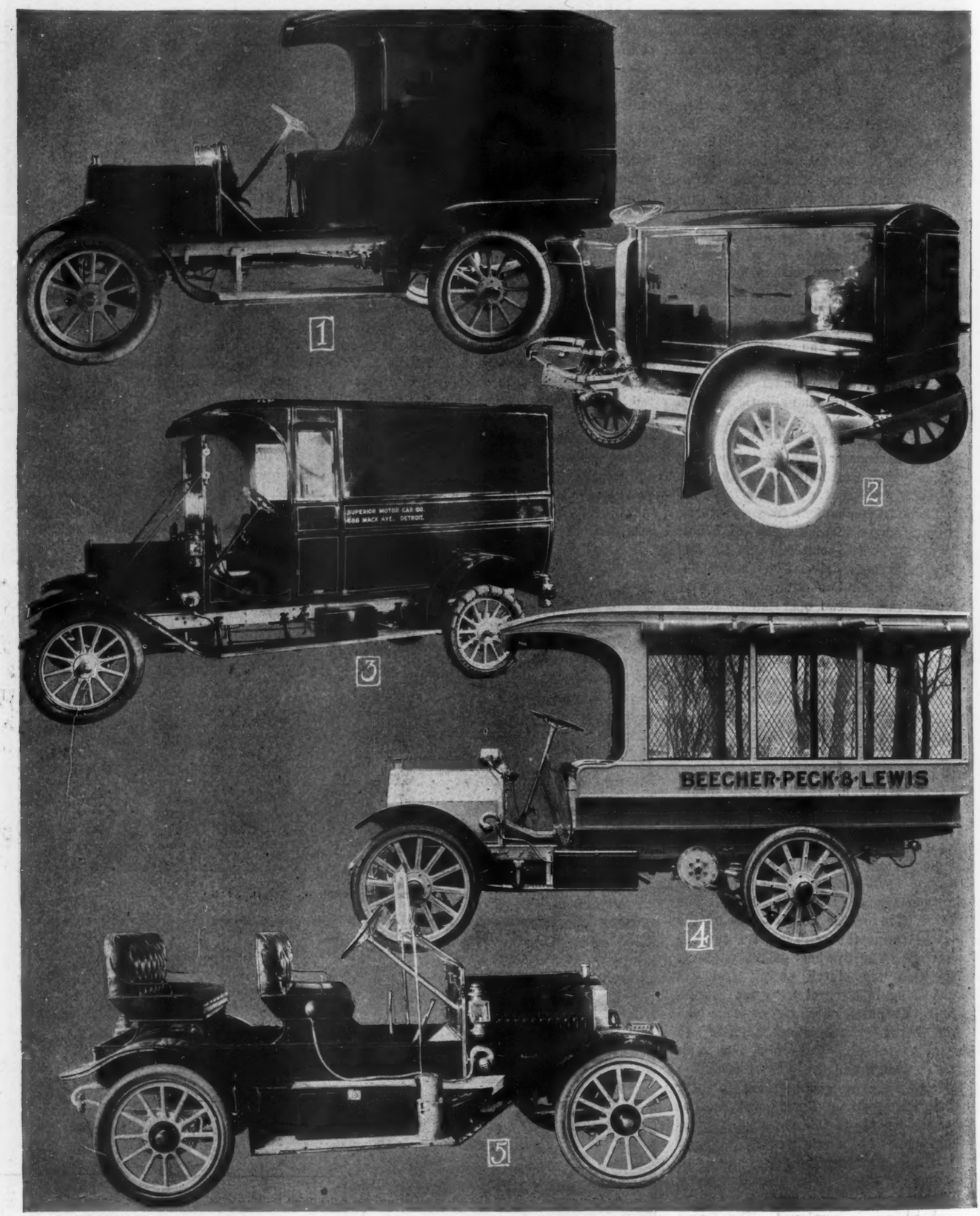
The Ideal, made by the Ideal Commercial Car Co., is a light delivery car which may be equipped with any type of body and weighs 1,900 pounds. The motor is a



RACING CAR IS FEATURE ON REGAL STAND

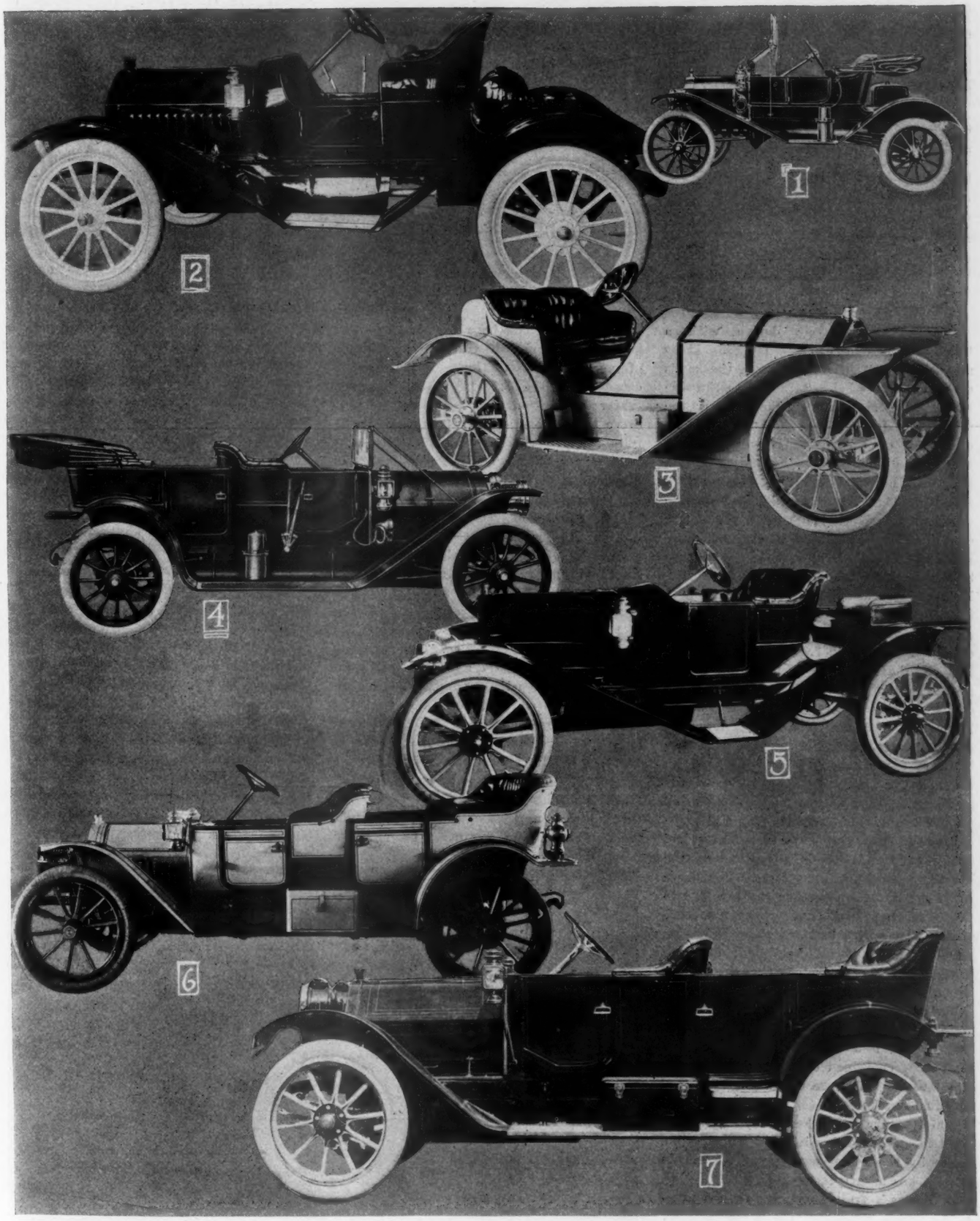
INTERNATIONAL HARVESTER SHOWS HIGH-WHEELERS

Commercial Vehicles That Are Making Debut at Detroit

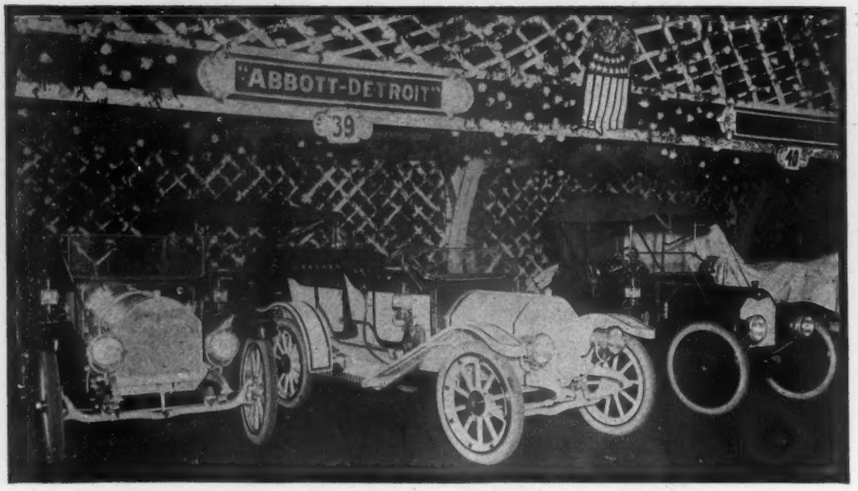


1—The Ideal Fitted with Panel Body for Delivery Work; 2—Wagenhals, a New One and of the Three-Wheeled Type; 3—Superior with Neat Enclosed Body for Delivery Work; 4—Federal Light Delivery with Panel Top; 5—Day Car which is of the Combination Type

Some 1911 Models Shown for First Time at Detroit Show



1—Ford Roadster with Torpedo Body; 2—The Whiting Runabout; 3—Cavac, One of the Newcomers; 4—New Model of the Cutting; 5—Carhartt with Rumble Seat; 6—Herreshoff with Fore-Door Body; 7—Carhartt of Fore-Door Type



ABBOTT-DETROIT IS MOST COMFORTABLY LOCATED

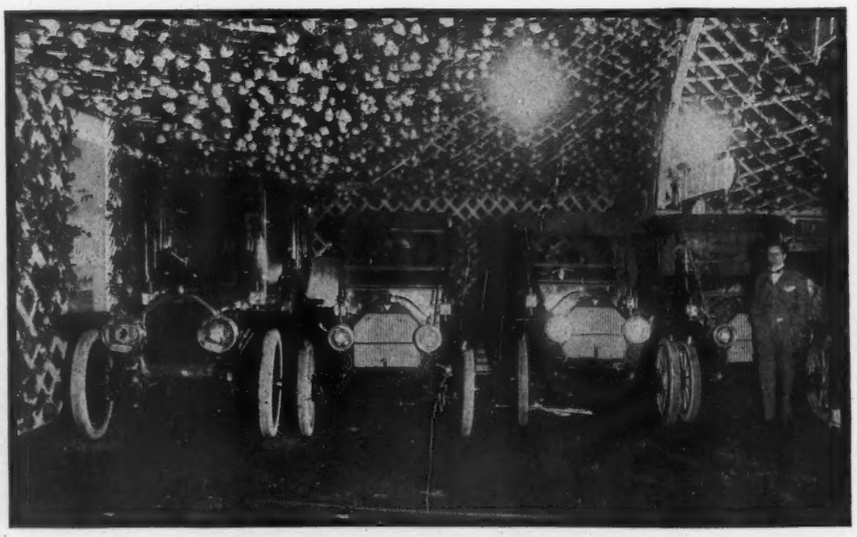
two-cylinder four-cycle design, with a bore and stroke of 4½ inches. It is mounted crosswise of the frame, the heads of the cylinders being attached to the side frame members; the flywheel is at the front just behind the radiator, and the crankcase of the motor is in unit with the housings of the multiple-disk clutch and a sliding gearset giving two forward speeds and reverse. An unusual feature of the motor is that the inlet valves are contained in the piston heads and automatically operated, and the fuel mixture is drawn almost directly from the carbureter into the motor crankcase, as in a two-cycle motor. The exhaust valves are arranged as in an ordinary L-type motor and both are driven from a single cam on the camshaft which is mounted in an aluminum frame that forms part of the cover of the crankcase. Lubrication is by means of a mechanical oiler mounted on the cover of the crankcase with two leads to the crankshaft bearings and one to each cylinder. Ignition is by means of a dual system with a magneto mounted on the top of the clutch casing and gear-driven off the clutch shaft. A vertical round tube radiator is a feature of the thermo-syphon cooling system. The drive is by means of a propellor shaft with two universal joints; the rear axle is a semi-floating type with ball and roller bearings; an I-beam front axle is used; and the frame is of pressed steel channel section mounted upon semi-elliptic springs. The wheels are equipped with 32 by 4-inch quick detachable tires, the wheelbase is 102 inches, and the tread 56 inches. A fool-proof combined clutch and gear shifting lever is a feature of this car.

Quadru Trucks

The Quadru is a heavy-duty gasoline-electric motor truck with four-wheel drive, made by the Fuller company. It weighs 6 tons, has a carrying capacity of 10 tons, and carries a trailer with a capacity of 5 tons. Each wheel of the Quadru truck is driven by a 3½-horsepower electric motor with a claimed overload capacity of 250 per cent. A 32-horsepower gasoline engine with a 5-inch bore and 6-inch stroke is directly attached to an electric generator of peculiar construction. These are located under the driver's seat. The generator delivers current to the motors that drive the wheels, and a single chain transmits the power from each motor to each road wheel. The wheels are 38 inches in diameter with dual block tread tires, having a combined face width of 10 inches. The wheelbase of the main truck is 147 inches. Under about the center of the body of this truck an electric winch is arranged which operates a crane and a windlass. The crane is mounted in the center of the body and capable of placing a 1,000-pound load on any part of the body or trailer at one time. The windlass is arranged alongside and practically integral with the winch, which also is electrically operated. There is a contracting brake on each motor shaft. The total length of the outfit with the trailer is 44 feet, and it can be turned in a 24-foot street, it is claimed. Steering of the truck is mechanical in that the power for turning the front axle is obtained direct from the gasoline motor. The gasoline motor is a standard four-cylinder four-cycle T-head design, and the electric generator which produces the electric current is of a construction in which all starting shocks are eliminated. It produces no voltage at normal speed, but as the speed increases the voltage gradually increases until the speed of the vehicle may be maintained at 11½-miles per hour and it can be operated as slowly as 1 mile in 6 hours.

Features of the Superior

The features of the Superior commercial cars, made by the Superior Motor Car Co., of Detroit, comprise a 25-horsepower motor with four cylinders, having a bore and stroke of 3¾ inches by 4½ inches. They are cast en bloc, of the L-type with the valve chambers on the right side, and mounted on an aluminum crankcase. The crankshaft is mounted on two plain bearings; lubrication is by means of a constant level circulating splash system with a plunger pump driven by a cam on the camshaft; ignition is by means of a dual system with an accessible gear-driven magneto and coil, and a set of dry cells; thermo-syphon cooling is employed. Three-point suspension is a feature of the motor support. From the flywheel of the motor, power is transmitted through a short horizontal shaft and a single universal joint to a long propellor shaft enclosed in a torsion tube to the planetary gearset, which is bolted integrally with the rear axle housing. The gearset gives two forward speeds and reverse. The rear axle is a semi-floating design with Hyatt roller and ball-thrust bearings; and the front axle is an I-beam construction with adjustable ball bearings for the wheels. The frame is an extra heavy pressed steel structure of channel section with three tubular, and three channel cross members having integral gusset plates; it is mounted on semi-elliptic front springs and three-quarter platform springs in the rear. The wheels are equipped with 30 by 3½-inch pneumatic tires; the wheel-



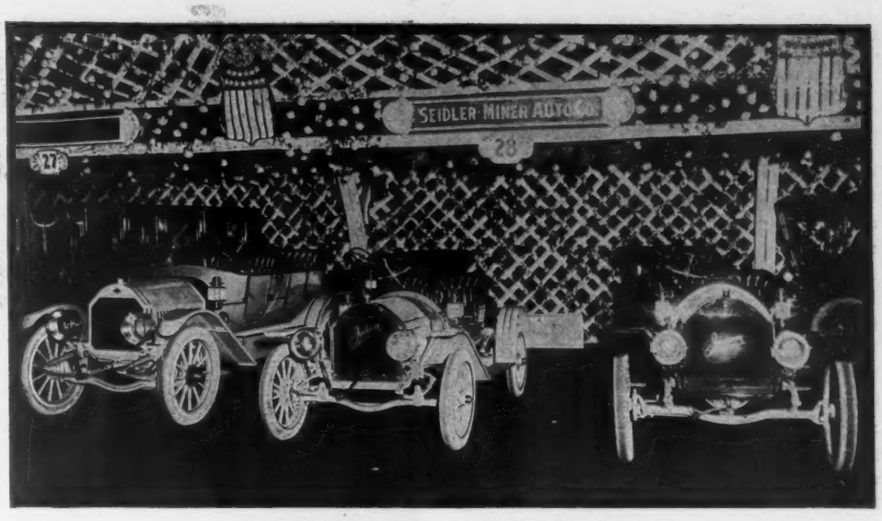
WHERE THE HUDSON GREETS ITS FRIENDS

base is 124 inches, and the tread 56 inches. A feature of the car is the right-hand control with the emergency brake and gear-shifting levers in the center. These levers are mounted in a quadrant and pivoted in the center of a heavy channel cross member. There are three pedals, the extreme left one operates the external brakes on the rear wheel drums, the middle pedal the low-speed forward, and the right pedal the reverse speed. The motor control levers are conventionally mounted over the steering wheels.

Wagenhals a Three-Wheeler

The Wagenhals is a three-wheeled special delivery car, manufactured by the Wagenhals Commercial Motor Car Co. It carries from 800 to 1,000 pounds, has a 20-horsepower motor and weighs 1,800 pounds. The motor is a two-cylinder opposed, of L-type design with a 5-inch bore and 4-inch stroke. Lubrication is by means of a force-feed oiler. Single jump-spark ignition with a timer, Heinze coil, and twelve dry cells are employed; and thermo-syphon cooling is used. Transmission is by means of a planetary gearset giving two forward speeds and reverse, and single chain drive to the rear wheel. The main frame is a steel structure of channel section and reinforced with gusseted corners, and it is mounted directly upon the axles, which are of Wagenhals' design. The wheels are equipped with Timken bearings and 32 by 3-inch tires. The body with the driver's seat at the rear is mounted on elliptic front springs and three-quarter scroll elliptic rear ones.

Many very interesting details are to be found in the construction of this car. The motor and gearset is mounted on a sub frame which is hinged at two points in the front, and flexibly attached to a single coil spring at the rear, so that road vibration is not transmitted to the power plant and the whole power and gearset mechanism can be very readily removed from the car. The cylinders of the motor are on the right side of the sub-frame, lengthwise of the car; the flywheel is in the middle, and the gearset at the left, making a very symmetrical unit. In the cooling system there is a separate radiator for each cylinder which is mounted on either side of the body near its rear end, and rubber hose connections are used between the radiator and cylinder. As for the control, the steering wheel is in the center of the car and communicates with the front wheels in a conventional manner. There are three pedals, one at the extreme left for the reverse speed, the inner left pedal for the low-speed forward, and the right pedal for the service brake, which is external on the rear wheel drum. The high-speed hand lever is at the right. Engine control levers are on sectors attached to the steering column under the steering wheel. A new taxicab body for this car probably will be shown at the Chicago show.

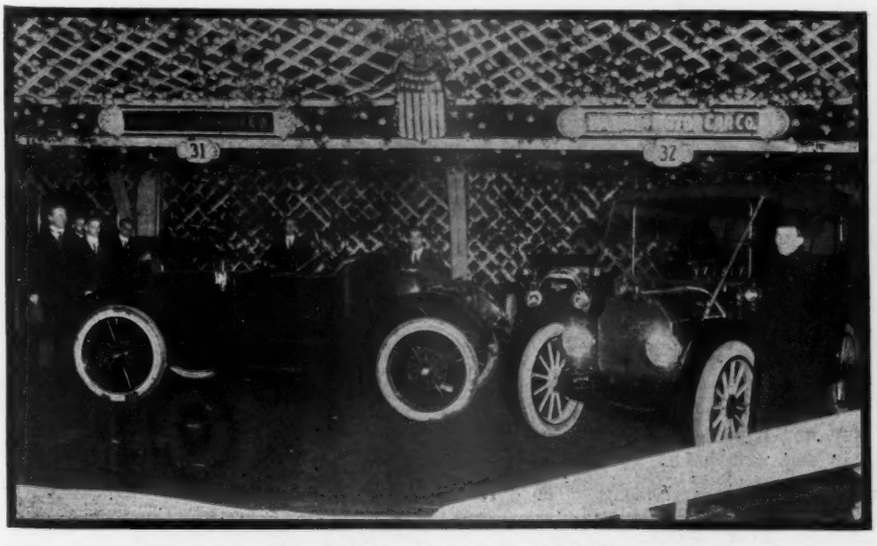


JACKSONS ARE THERE IN THEIR NEW DRESS

Others Make Their Debut

Among the new models of cars not previously exhibited this year are the Carhartt, Jr., the Herreshoff small car, and the Whiting.

The new Carhartt model, made by the Carhartt Automobile Corporation, Detroit, will be made in four body styles, including a roadster with a rear box and rumble seat, a roadster with a tank and tire holder behind it, a fore-door touring car and a fore-door toy tonneau. The mechanical features of the chassis comprise a four-cylinder L-type-water-cooled motor in unit with an enclosed leather-faced cone clutch and three-speed selective sliding gearset mounted at four points on a subframe. Drive is through a propellor shaft, enclosed in a torsion tube with a single universal joint at the forward end. The rear axle is a semi-floating design and the front axle an I-beam drop forging. The pressed channel steel frame is raised over the rear wheels, narrowed in front, and mounted on semi-elliptic front springs and three-quarter scroll ellipticss in the rear. Wheels are equipped with 32 by 3½-inch tires front and rear. Conventional right hand control is used except that the clutch and service brake are both operated by a single pedal. The emergency and gear-shifting levers, which are at the right of the driver's seat, are arranged inside of the torpedo bodies; and the engine control levers are over the steering wheel. As for details the bore and stroke of the cylinders are 4½ by 4½ inches, and the valves are on the left side. Ignition is by means of a magneto and coil, and a set of dry cells, and the magneto is driven off a shaft which passes through the water pump to the encased engine gears at the front of the motor. A circulating splash lubricating system is employed with a plunger pump internally arranged and driven off the camshaft. A vertical flat tube radiator, adjustable belt-driven fan and centrifugal pump are features of the cooling system. Hyatt roller bearings are employed in the rear axle.



DISPLAY MADE BY WARREN-DETROIT COMPANY

Herreshoff Practically New Model

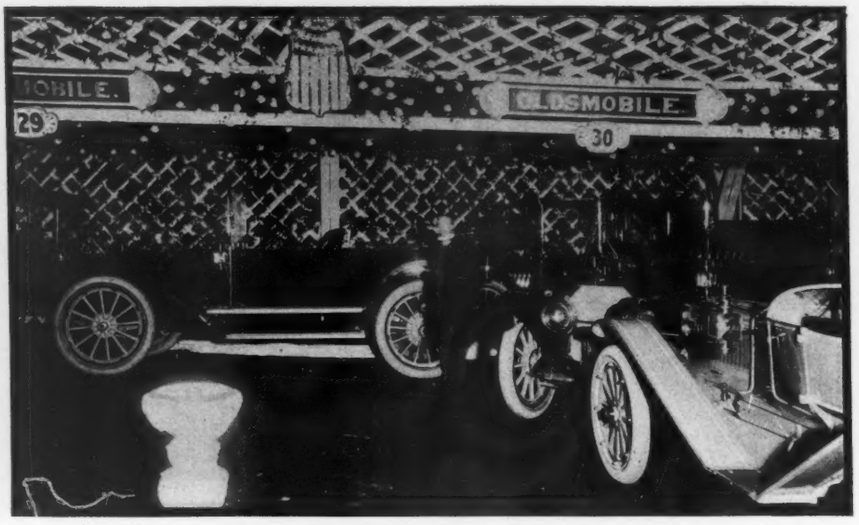
In the Herreshoff line the Herreshoff 30, made by the Herreshoff Motor Co., Detroit, and continued from last year, is practically a new model. The motor is entirely new, its cylinders being cast en bloc instead of in pairs, its crankshaft being mounted on plain bearings instead of

ball bearings, and the oiling system being rearranged to suit the different construction. The ball-thrust bearing of the propellor shaft is more accessible, there is a slight change in the design of the gearset, a new rear axle is employed with Hyatt roller bearings for the rear wheels, and the front wheel bearings are of the cup-and-cone adjustable ball type instead of roller. The wheelbase has been lengthened from 105 to 110 inches.

The entirely new model brought out by the Herreshoff company this year is a left-hand drive car with the hand levers in the center of the foot-board, which will be equipped with either a three-passenger runabout body with a rumble seat, a three-passenger torpedo runabout body with a rumble seat, or a light delivery car body which is interchangeable with the others and may be removed by loosening four nuts. The features of the new chassis include a four-cylinder L-type en bloc water-cooled motor, in unit with a multiple-disk clutch and a three-speed sliding selective gearset. The drive from this power and transmission unit is by means of a propellor shaft enclosed in a torsion tube, with a single enclosed universal joint at its front end. The rear axle is a semi-floating design and the front axle an I-beam construction. The wheels are equipped with 32 by 3-inch tires and the wheelbase is 98 inches. A pressed steel channel frame is employed and it is mounted on semi-elliptic springs.

Features of the Whiting

In the Whiting cars, manufactured by the Whiting Motor Car Co., of Flint, Mich., and exhibited for the first time this year, several changes or rather improvements are to be found over the 1910 models. The motor is now mounted on an aluminum crankcase instead of a cast-iron one and side plates have been added to give easy access to the crank chamber for inspection or adjustment of the connecting rod bearings. The cooling efficiency of the radiator has been increased by adding a tank at the top rear portion of the radiator, and an adjustable belt-driven fan is fitted. A muffler cut-out also has been attached, and the engine control levers have been improved by using friction instead of notched sectors. Improvements also are to be found in the lubrication system, the tank being attached to the dash instead of arranged on the cylinders so that now more accessibility of the motor parts is obtained. There is a sight feed on the dash, and the feeds have been made more efficient. The clutch is larger and a ball-thrust bearing has been added; and the front end of the torsion tube is now yoked to the malleable cast steel cross member of the frame. The gear ratio of the rear axle is increased from 3½ to 1 to 4 to 1. More leg room is obtained in the body by narrowing the tool box; and mud aprons are added between the running boards and frame.



STAND WHERE THE OLDSMOBILE IS SHOWN

The same Ford car-marks that have distinguished the Ford cars for the past few years are noticeable in the model T for 1911. There is, in fact, practically no change from last year's model. The left hand control, flywheel magneto and the vanadium steel construction are played up this year as herctofore and several types of bodies are fitted to the one chassis.

The power plant consists of a four-cylinder motor with a bore of 3¾ inches and a 4-inch stroke. The cylinders are of the L-head type and are cast en bloc. A thermo-syphon circulation of water is used for cooling the cylinders with a vertical tube radiator and a belt-driven fan. The lubrication of the motor is of the flywheel-circulating type, with an oiler capacity of 2 gallons. The magneto of the Ford design is built into the flywheel, the spark being controlled by hand. A multiple-disk clutch of hardened steel transmits motion to a planetary gearset having two forward speeds. Tires 30 by 3 inches are used, and the wheelbase is of 100 inches. Final drive is by shaft with a single universal joint to bevel gears in the live axle.

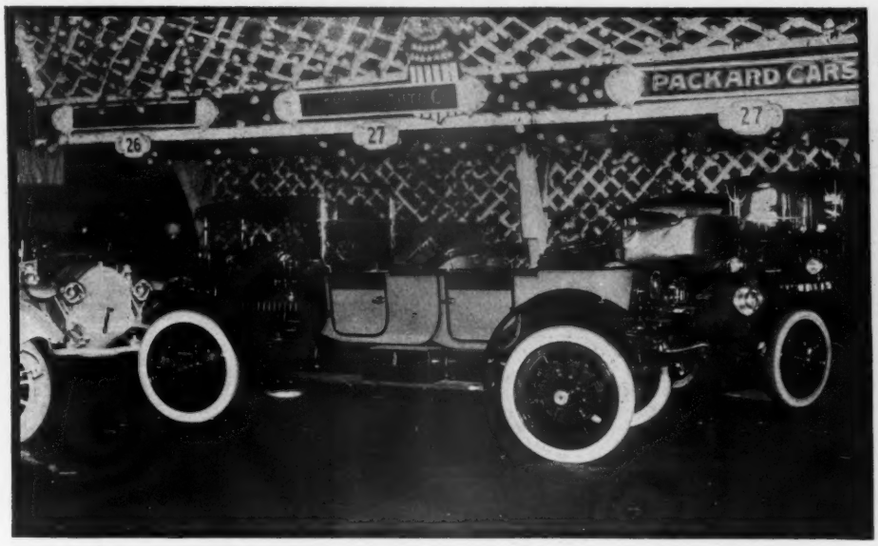
The ignition scheme on the Ford cars is one of the distinctive features in that a low-tension magneto generator is used, the magneto having no commutator or brushes, no contact points, no moving contacts or moving wire and no gearing. The rotating member of the magneto is a part of the flywheel, while the stationary part which carries the armature coils in which the current is generated is a spider permanently attached to the engine, the whole magneto being carried inside the flywheel casing.

Among the bodies fitted on the model T chassis are found a five-passenger touring car, a roadster with a detachable rear seat, a four-passenger tourabout with the rear seat detachable, a town car, coupe, landaulet and a torpedo runabout.

The Clark-Carter Automobile Co., of Jackson, Mich., catalogs six pleasure car models for 1911, whereas in 1910 a single chassis design with a touring car body completed the line. The new models include: A model A-30 roadster, with a Wisconsin motor of 30-horsepower, having a 3¾-inch bore and 5-inch stroke, and wheels with 32 by 3½-inch tires; model B-40 touring car, with a Milwaukee engine of 30-horsepower, having a 4⅜-inch bore and 4½-inch stroke, and 34 by 3½-inch tires; model D-50, a touring car with or without fore-doors, with a 40-horsepower Model motor, with a 4½-inch bore and 5-inch stroke, and 36 by 3½-inch tires; Model E-50, with a torpedo type body for five passengers and the same features as on the model D-50. Except for the motors in these cars the chassis design is practically identical and all have 116-inch wheelbase. In addition to these models there is a model F-60 touring car with fore-doors, for five or seven passengers, and a model G-60, with a torpedo type of touring car for five or six passengers. Both the latter are mounted on a single chassis design, having a Wisconsin motor, with a 4¾-inch bore and 5½-inch stroke, from which 60-horsepower is claimed. The wheelbase is 122 inches, and 36 by 4-inch tires are employed, with demountable rims. Other features of chassis design common to all the cars are that the motors have four cylinders; selective sliding gearsets are employed with three forward speeds on all models but the 60-horsepower ones, which have four; propeller shafts are in a torsion tube on all models but the 60's, which have two universal joints; semi-floating rear axles are fitted to all models but the 60's, in which full floating axles are employed; and all have an I-beam front axle, pressed steel frame, semi-elliptic front springs and three-quarter scroll in rear.

Sibley 30 for 1911

The Sibley 30, model A, a two-passenger roadster, manufactured by the Sibley Motor Car Co., Detroit, Mich., also



DISPLAY OF PACKARDS A NOTEWORTHY ONE

makes its initial appearance. It has a 30-horsepower motor with four cylinders cast en bloc and of L-type construction, with a bore and stroke of 3¾ by 5 inches, respectively. Its lubrication is by means of a circulating constant level oiling system with a gear pump; thermo-syphon cooling with a horizontal flat tube radiator and belt driven fan are employed; ignition is by means of a single high-tension Bosch magneto system, and carburetion is by means of a Williams carbureter. A leather-faced cone clutch, selective sliding gearset located amidships and giving three forward speeds, a propellershaft, and a semi-floating rear-axle, are comprised in the transmission system. The frame is a pressed steel structure, mounted on semi-elliptic front and elliptic rear springs. The front axle is an I-beam forging; the wheelbase is 106 inches, and 32 by 3½-inch tires are used.

IOWA'S LATEST BILL

Des Moines, Ia., Jan. 16—Motor legislation promises to be among the most important to be considered during the present session of the Iowa legislature, which has now been on for a week. Senate file No. 8, one of the very first bills introduced in the senate, provides for a motor tax. The bill would levy a tax of $1 for each horsepower, but no machine is to be taxed more than $25, while the tax on motor cycles is to be $5 if the bill becomes a law. All moneys accruing from the licensing and regulating of motor cars and motor cycles, except that required to pay the expense of collection, is to go into a state highway fund. The bill provides for the creation of a state highway department, which will consist of two professors of civil engineering in the two state technical schools, and a civilian, to be appointed by the governor. They will serve without pay and will appoint the state highway engineer, who will receive a salary of $4. The bill has been referred to the judiciary committee.

In the house of representatives, David E. Kulp, of Palo Alto county, has prepared a bill taxing motor cars per horsepower, providing an age limit for drivers at 18 years, and specifying that all money collected according to the proposed act shall be devoted to a road fund, to be divided equally among the counties of the state.

Mr. Kulp's bill will combine all taxes and licenses on motor cars into one, which shall be paid as a license. Mr. Kulp considers 40 cents per horsepower a fair rate of taxation, but has not yet decided upon this feature of the bill.

PLUGGER FINISHES RUN

Atlanta, Ga., Jan. 16—With its speedometer registering a grand total of 35,049 miles, the Regal Motor Car Co.'s endurance car, the Plugger, hove into Atlanta the other day, escorted by a string of other cars, which had gone forth into the country to meet it. The Plugger's reception in Atlanta was a big one, owing to the fact that it was the end of this last big tour. The all-southern tour of the Plugger began at Norfolk, Va., on September 15. From there the route lay into northern Georgia, across Tennessee and west to the border line of Texas. Turning back east, the course of the Plugger took it south to the gulf through Louisiana and Georgia, thence back again to Atlanta. Once more leaving the capital of Georgia, the run this time extended into Florida as far as Jacksonville, and return.

SPRY FAVORS GOOD ROADS

Salt Lake City, Jan. 12—When the Utah state legislature convened Tuesday, Governor Spry boosted for the good roads movement in this state. Governor Spry said in part:

"Under the supervision of the state road commission, 125.35 miles of state roads were built at a total cost of $105,243, making the cost per mile approximately $840. The state appropriations for the state road construction used in the construction of above mileage amounted to $54,000. The total revenues from various county sources for state road construction were $51,243.

"I recommend the passage of a law fixing the responsibility for the flooding of the public highways of the state through the overflow of canals, ditches or laterals upon abutting property owners, power or canal companies, or municipalities. The state road commission is unanimous in its request that the annual appropriation for state road construction be increased to $60,000. It is gratifying to report increased interest in the good roads movement during the past 2 years. State and interstate good roads conventions have been largely attended, and I earnestly recommend that the legislature foster the sentiment for good roads in every way within its power."

BADGERS ARRANGE TOUR

Milwaukee, Wis., Jan. 17—More than 250 of the leading motorists of Wisconsin, representing twenty clubs, attended the mid-winter convention of the Wisconsin State Automobile Association, held in connection with the show, this afternoon.

Four trophies will be competed for in the second annual reliability tour to be held next July as the result of the acceptance of three new awards by the association on Tuesday. The Milwaukee Sentinel trophy, won by a Buick last July, is a perennial one. The three new trophies offered today are for the permanent possession of the winners in each division, and the donors will give a new prize each year.

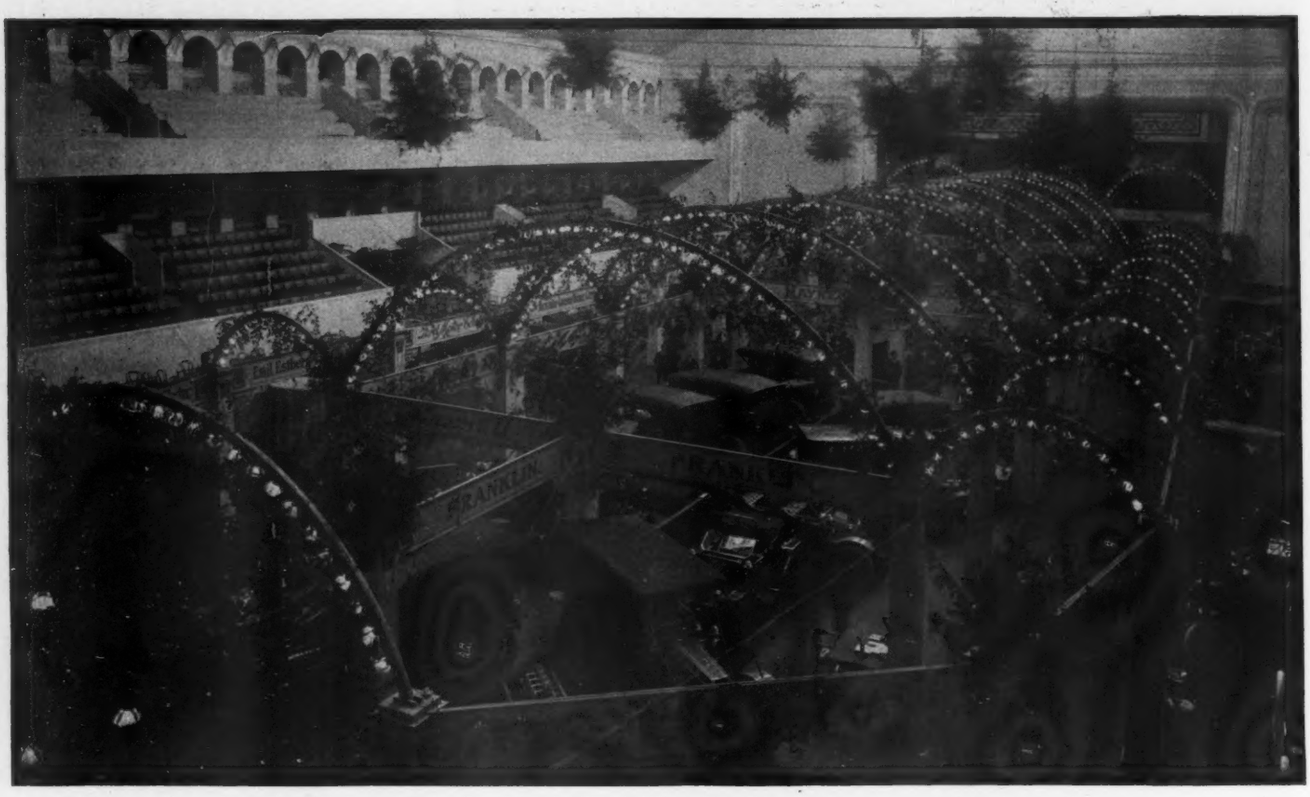
Emil Schandein, one of the leaders of the Wisconsin good roads movement, an original motor car owner and one of the most enthusiastic members of the Milwaukee Automobile club and state association, created a real private owners' division by offering a silver trophy to the private male owner making the best score in the reliability.

The Milwaukee Journal, a leading daily newspaper of Milwaukee, donated a silver cup for permanent possession of the car making the best score. The winning car will receive not only the perennial Milwaukee Sentinel cup but the Milwaukee Journal trophy, of practically equal value.

The Evening Wisconsin, another Milwaukee newspaper, offered a valuable French clock to the roadster or runabout in the tour making the best score, thus creating a roadster division in the annual tour and making it more like the A. A. A.'s annual contest.

The route for the second tour, in 1911, as blazed by M. C. Moore, president of the state association, in last November, was practically adopted, the executive committee being empowered to make such changes as may be deemed advisable up to the time of the start. The tour will doubtless again be held during July. The route for the 1911 tour covers about 950 miles, whereas the 1910 tour called for a run of 805 miles.

Milwaukee Show An Attractive One



THE MAIN HALL OF THE AUDITORIUM AT MILWAUKEE WAS VERY TASTEFULLY DECORATED

MILWAUKEE, WIS., Jan. 16—That unity and harmony are the attributes of success in the presentation of a motor show is proven absolutely by inspection of Milwaukee's third annual exposition, which opened in the Auditorium at 8 o'clock on Saturday evening. It is the first annual show of the Milwaukee Automobile Dealers' Association, and the third to be given in Wisconsin's metropolis, the two previous shows having been under the management of the Milwaukee Automobile Club.

Whatever the conditions may be elsewhere, it is certain that in Milwaukee the dealer and manufacturer can hold the successful motor show, rather than the owner, as an organization like the M. A. C. There was harmony between the club and the dealers on the occasion of the first show in March, 1909, but the only show hall available was the Hippodrome, five or six of which could be dumped into the mammoth Auditorium building and hardly be noticed. The second club show in February, 1910, comfortably filled the Auditorium, but fourteen of the leading dealers in Milwaukee became insurgents and refused to get in.

Dealers Promoting Show

It is these fourteen dealers who form the nucleus of the M. A. D. A., which is holding its first—and eminently successful—show this week. Under their banner have gathered all of the other dealers who stood by the club in 1910. The club this year stands as a sub-sponsor.

Licensed and unlicensed cars stand side by side this year, not because of Judge Noyes' decision, but because the M. A. D. A. set out to present a complete show and give representation to all. In this connection it will be recalled that the $500,000 damage suit of the Velie Motor Vehicle Co., of Moline, Ill., against twenty-five A. L. A. M. members and an agent, the Kopmeier Motor Car Co., of Milwaukee, was the direct outgrowth of conditions at the 1910 show here. The Kopmeier company, handling the American, Chalmers and Detroit electric and also the Velie, was ordered not to display the unlicensed Velie at the 1910 Milwaukee show in connection with the licensed American and Chalmers. This order was obeyed and the contract with the Velie was abrogated. The suit followed and is still in the courts.

The Velie exhibit this year is one of the most prominent as well as one of the most beautiful at the Milwaukee show. The factory is the exhibitor.

Under an elaborate decorative scheme of the arcade type, in the immense arena, in the Juneau and Plankinton convention halls, in the corridors and entries, sixty-two distinct makes of pleasure cars, and sixty-one groups of accessories and parts are being shown at Milwaukee this year. In the basement under the arena, sixteen commercial car manufacturers are represented, making a total of 139 exhibitors. Motor cycles, which formed an important part of the 1910 show, are entirely absent because of the lack of room.

Uniform Decorations

In the decorative scheme the national show idea is carried out, a striking feature being the exhibitors' signs. The name of each car or the trade mark of manufacturer is given in the same design or combination and type of letters as in the original.

The list of foreign or out-of-the-state exhibitors is small, showing that the agency line of Milwaukee and Wisconsin dealers is as complete and representative as any other state, excepting perhaps Illinois and a few eastern states. Wisconsin distributors and factories outside of Milwaukee that are exhibiting are: J. I. Case Threshing Machine Co., Racine, the Case; LaCrosse Plow Co., LaCrosse, the Imperial; Orrin R. Hughes, Marshfield, the Garford and Garford truck. The Cutting company already has established a selling agency in Milwaukee as the result of exhibiting here, and the Velie, Henry, Westcott and Falcar doubtless will find representation before the close. The Petrel, made in Milwaukee, is being exhibited at the factory. The Moline is shown in private exhibit at the Wisconsin state agency, Waite Brothers.

Polished and cut-out chassis are being

shown in much larger number than last year. Among the most beautiful of these are the Great Western, Chalmers 30, Overland, Rambler, Cadillac, Peerless, Reo, Johnson, Rider-Lewis, Lozier and others. More than 75 per cent of the pleasure car exhibitors show stripped chassis.

In the Marmon exhibit is Joe Dawson's 36. The Buick branch shows all of the trophies won by Buick cars for several years back. All of the important trophies contested for this and last year are being displayed.

Commercial Car Exhibit

The commercial car exhibit, always one of the largest in the country, substantiates the claim this year. About forty cars constitute the department. One of the features this year is the exhibition of "sold" cars, an excellent method of showing how the truck can be adapted to business or industry, the various practical body types, with the trade marks and names of the purchasing firms painted on the bodies. Several cars that have been in use in Milwaukee are being shown by the makers, showing conclusively how they stand up under actual service. Milwaukee-made trucks predominate, not because the show is in Milwaukee, but for the reason that Milwaukee is one of the leading commercial car building centers in the world.

The Sheldon Axle Co., of Chicago, has an exhibit in the commercial section.

The Milwaukee show is essentially a retail selling proposition. Of scarcely secondary importance is the sub-agency proposition. While the bulk of visiting patronage is from Milwaukee, the state sends enormous delegations and last year's attendance record of 20,000 is expected to be increased to at least 25,000 or 30,000 this year.

The show opened Saturday night, but was closed all day Sunday, reopening Monday at 10:30 a. m. The show will close on Friday night. In making this arrangement of dates, the M. A. D. A. has established another precedent, but one that is of especial advantage to the class of exhibitors who are at this show.

Nearly all the cars seen at the exhibition in the Milwaukee Auditorium have appeared at the New York shows, or at Detroit, but among those making their first appearance for this year at Milwaukee are the Falcar and Rider-Lewis pleasure cars, and the Sternberg, Brodesser, Utility, Champion and Abresch trucks. Some of those making their first appearance at Milwaukee also will be seen in Chicago. Among them are the Falcar pleasure vehicles and the Brodesser motor trucks, description of which will be reserved for a later issue.

Rider-Lewis Motor Cars

The Rider-Lewis cars, made in Anderson, Ind., and exhibited in Milwaukee by Bonow Bros., are shown in four chassis models. In three of them a Rutenber four-cylinder motor is used, with a 4-inch bore and 4-inch stroke, giving a rated horsepower of 25.6 under the A. L. A. M. formula. The cylinders are cast separately, the cooling being by means of a gear-driven pump. The motor is oiled by constant-level splash system maintained by a positive-driven gear pump. The ignition is a dual system, a Splitdorf high-tension magneto being used. A leather-faced cone clutch transmits motion to a propeller shaft to the rear wheels. In the model G, which is a five-passenger touring car, either fore-door or standard, the wheelbase is 110 inches, with 34 by 3½-inch tires. The gearset is combined with the rear axle, the front axle being a drop-forged I-beam. External and internal brakes are used on the rear axle, and the springs are semi-elliptic in front and elliptic in rear. A particularly neat appearing roadster is the type IV, mounted on the same chassis. The type B touring car has a chassis identical in nearly every respect to the model G. The tires, however, are 32 by 3½ inches, with a 108-inch wheelbase.

The seven-passenger touring car, type VI, is equipped with a six-cylinder motor of 4-inch bore by 4½-inch stroke, giving it an A. L. A. M. rating of 38.4 horsepower. The cylinders are cast separately and the chassis specifications are practically the same as the smaller cars, except that the tires are 34 by 4 inches with a 122-inch wheelbase.

Champion Trucks

The C. F. Megow Co., of Milwaukee, present three chassis of 1-ton, 2-ton and 3-ton capacity, respectively. The 1-ton truck has a maximum load capacity of 3,000 pounds. Its power plant consists of a four-cylinder motor, with the cylinders cast in pairs. They are 4¼ inch bore and 4¾ inch stroke, giving it 28.9 A. L. A. M. horsepower. The ignition system is high-tension dual, with batteries and magneto. A self-contained oiling system is used, in which the oil is supplied under pressure from a gear pump on the outside of the crankcase and driven by a pair of bevel gears from the camshaft. A multiple-disk clutch running in oil transmits motion to a propeller shaft. Final drive is through side chains. A three-speed selective gearset is located as a unit with the differential. The service brakes are of the contracting-band type and located on the jackshaft. Emergency brakes are internal-expanding, on the rear axles. A 4-inch rolled steel channel frame is supported on semi-elliptic springs. The wheelbase is 120 inches and the tires are 34 by 3½-inch solids. A speed of from 3 to 18 miles an hour is obtained on the high gear.

The 2-ton truck is built on the same lines, the general construction being a little heavier. The motor of this model is the same bore, but has a 5-inch stroke. It is a T-head motor and the cylinders are cast in pairs. On both the 2-ton and 3-ton trucks a high-tension double ignition system is used, with an igniter and a magneto. The wheelbase in both chassis is 4 inches longer than in the 1-ton model and the tires are larger. Platform springs are used in the rear in place of the semi-elliptic springs seen on the lighter truck. The principal feature of difference in the

TWO VIEWS OF JUNEAU HALL AT THE MILWAUKEE AUDITORIUM WITH EXHIBITS ARRANGED ALONG EITHER SIDE OF A BROAD CENTER AISLE

A Heavy Truck of Sternberg Make

One of the Champion 1-Ton Commercial Cars

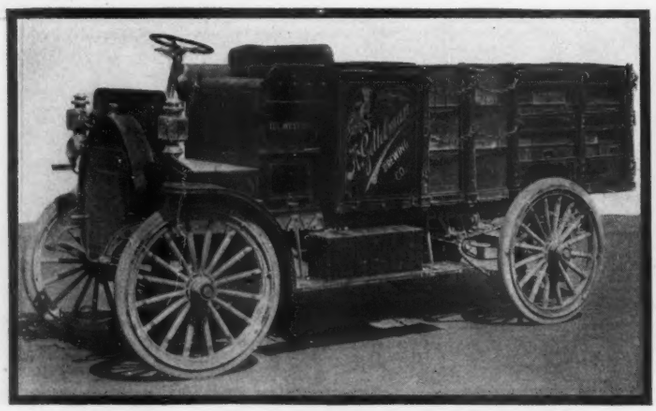
3-ton truck from the 2-ton model is a larger motor. This has cylinders of 4¾ inch bore and 5½ inch stroke, giving it an A. L. A. M. rating of 36.1 horsepower. The cooling system in this model, as in the others, comprises a gear-driven pump and tubular radiator. The sprocket hub and nut is an ingenious arrangement which allows for alignment of the forward sprocket with the sprocket on the rear wheel. A special taper lock is used in place of the usual device.

Among the cars shown for the first time in Milwaukee are the Abresch trucks, which were exhibited by the Abresch-Cramer Auto Truck Co. These cars are shown in three models, ranging from 1½-ton to 4-ton capacity. Model A chassis rated at 1½ to 2 tons, and their model B rated at 2 tons to 3 tons, is equipped with the same motor. This is a four-cylinder water-cooled motor of the T-type and has a bore of 4¼ inches and a stroke of 5 inches. A magneto is used with dry cells as auxiliary source of current for the ignition. A gear-driven pump, with a flat-tube radiator, comprises the cooling arrangements. A multiple-disk clutch, with a three-speed selective clutch-type gearset located in unit with the differential, is combined with the double-chain drive to form the transmission system. The motor lubrication is of the circulating type, with a gear pump to maintain a positive pressure. In the model A chassis the frame is of 4-inch channels hung on elliptic springs in front and platform springs in the rear. The wheelbase is 115 inches, and the wheels are 36 inches in the rear and 42 inches in front, with 3½-inch and 4-inch tires. The frame of the model B chassis is a 5-inch steel channel, hung the same as model A, the wheelbase, however, is 132 inches and the tires are 36 by 4 inches in front, and 42 by 5 inches in the rear.

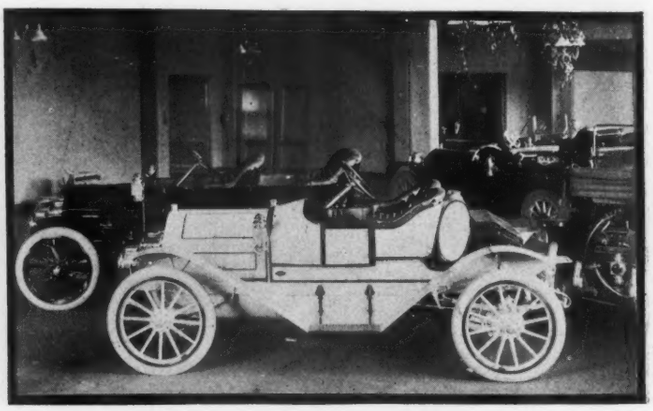
The construction of the model C or 3-ton chassis is the same as that of the others except that it is slightly heavier. The motor is larger, having a bore of 4¾ inches and stroke of 5½ inches, and an A. L. A. M. rating of 36.1 horsepower. The frame is made of heavy 6-inch steel channels, with elliptic springs in front and platform springs in the rear. The wheels are of the artillery type, 36 by 5 inches in front and either 42 by 7 or 42 by 4 dual in the rear, with a wheelbase of 140 inches.

The choice in bodies is left with the purchaser, all the chassis being so constructed that seats can be arranged back of the hood covering the engine, or over the engine itself.

The Crown trucks are Milwaukee products and are made by the Crown Commercial Car Co. A single chassis model is used and a number of bodies for different business purposes are mounted thereon. This chassis is called the model A and is equipped with a Davis two-cylinder horizontal opposed motor of 5¼-inch bore by 4-inch stroke. The motor is water-cooled on the thermo-syphon principle. Mechanically-operated valves are used with a pushrod which is fitted with an adjustment to eliminate the clicking sound often found in this type of engine. The system of oiling is optional, either a sight-feed mechanical oiler or a self-contained base oiler being furnished. The ignition is a dual system, using a magneto with dry cells and coil as auxiliary. A selective sliding-clutch type of transmission is used, giving three speeds forward and one reverse. A multiple-disk steel clutch running in oil furnishes motion to a jackshaft, driving the rear wheels by side chains. An angle-iron frame is supported by elliptic springs front and rear. External drums on the rear wheels form the emergency brakes, while double-acting brakes on the jackshaft are operated by foot pedals for service work, and all the brakes are equalized. The wheels are 36 inches in diameter, equipped with 2½-



The Utility 1-Ton Truck Carrying a Milwaukee Product



Two of the Rider-Lewis Cars Shown by Bonow Brothers

ABRESCH FIRE DEPARTMENT MOTOR WAGON

THE CHAMPION 3-TON TRUCK UNDER LOAD

inch special solid rubber tires, with a wheelbase 104 inches in length. The carrying capacity of the truck is rated at from 1,000 to 1,500 pounds. The body types include a panel delivery body, a screen body, several types of open or democrat bodies, and a combination of a delivery car and touring car. A distinctive feature of this car is the interchangeable power plant, which is coming into general favor with many types of commercial cars.

Utility Trucks

Utility commercial cars made by the Stephenson Motor Car Co., of South Milwaukee, are shown in two chassis types. The type B, regularly equipped with any one of several different bodies, has a four-cylinder motor with 4¼-inch bore by 5-inch stroke, giving it an A. L. A. M. rating of 28.9 horsepower. The cylinders are cast in pairs and are of the L type. The ignition is the single high-tension system, a magneto being used.

In these trucks a double-friction transmission is used. The two driven disks which take the place of the flywheel are connected by forged shaft directly to the crankshaft of the motor. Both of the friction wheels are slid on jackshafts by means of two arms operated by the change-speed lever. By operating a foot pedal one friction wheel is moved forward against the front driven disk and the other is pressed against the rear disk at the same time, so both road wheels are rotated in the same direction. This method does away with the necessity of a differential, for each friction wheel drives its respective road wheel, and each will pull the entire load independently of the other when necessary. Final drive is by means of side chains to the rear wheels, which are 40 by 3-inch solid rubber with a wheelbase of 110 inches. Internal-expanding brakes are used having a 4-inch face. A speed of from 3 to 25 miles per hour is claimed. The load capacity of this model is 1 ton.

The type C chassis, rated at 3 tons capacity, is constructed on the same lines as the smaller one, but is equipped with a motor whose bore is 4¾ inches by 5½-inch stroke. The wheels are fitted with 42 by 5-inch solid rubber tires on a wheelbase of 136 inches. The bodies fitted to these trucks include screen, platform, stake, and express types, depending on the needs of the purchasers.

Sternberg Trucks

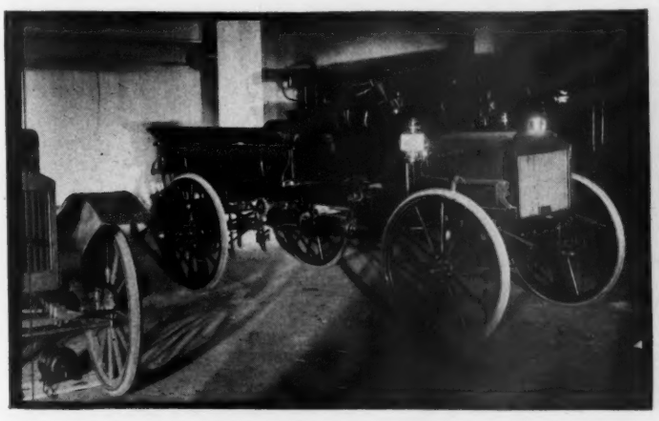
To the two models shown last year, a 1-ton friction-driven truck and a 1½-ton design with clutch type of gearset, the Sternberg Mfg. Co. has added a 3-ton power wagon. On the 1 and 1½-ton types a two-cylinder water-cooled motor with horizontal cylinder is used. The bore is 5½ inches and stroke 5 inches, giving an A. L. A. M. rating of 24 horsepower. The motor of the 3-ton truck is of the four-cylinder vertical type, water-cooled, with 5-inch bore and 6-inch stroke.

In the 1½-ton chassis there is very little change from last year's design, the transmission being located amidship and mounted on a subframe. The jackshaft and differential are incorporated with it and double-chain drive to the rear wheels is employed. The wheelbase is variable, depending on the length of the body, and runs from 110 to 124 inches. A wood frame reinforced with steel is used and is carried on semi-elliptic vanadium steel springs. The axles are solid forged steel and are fitted with Timken roller bearings. Solid tires are used throughout, the front ones being 34 by 3½ inches, and rear ones 36 by 4 inches. A heavy-duty Hele-Shaw clutch is used.

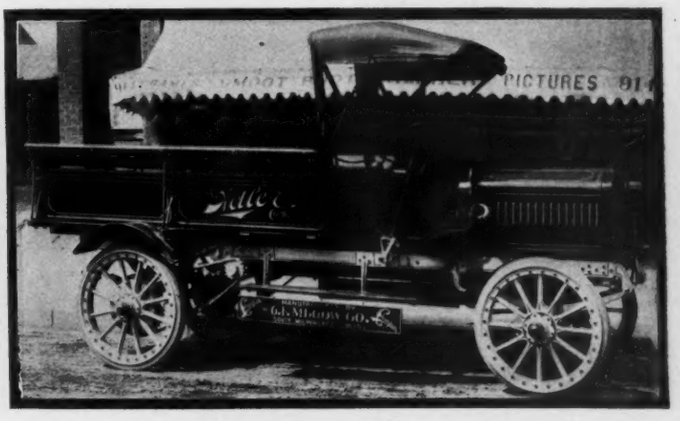
The engine has a governor which operates a secondary throttle valve in the intake pipe, which makes it impossible for the driver to race the engine.

The friction-driven truck uses the same motor, with wheels of the same diameter, but slightly smaller tire. The friction set consists of a single friction disk of macadamite carried on the propeller shaft. This transmits power to a 24-inch wheel having a fiber face.

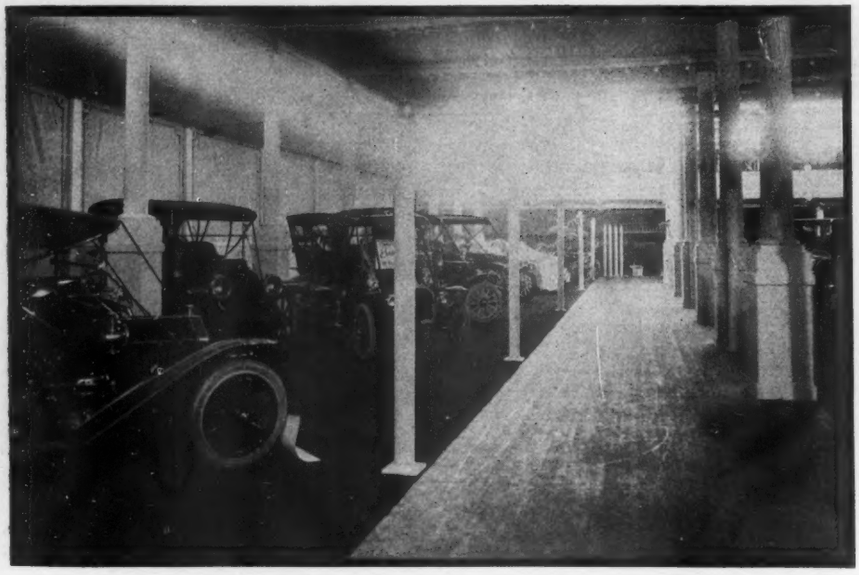
In the 3-ton truck the ignition is double, using a magneto, and the frame is a 6-inch steel channel inlaid with wood



ONE OF THE CROWN CARS FOR COMMERCIAL PURPOSES



A CHAMPION TRUCK OF 2 TONS CAPACITY



ONE OF THE AISLES IN THE FIRST REGIMENT ARMORY

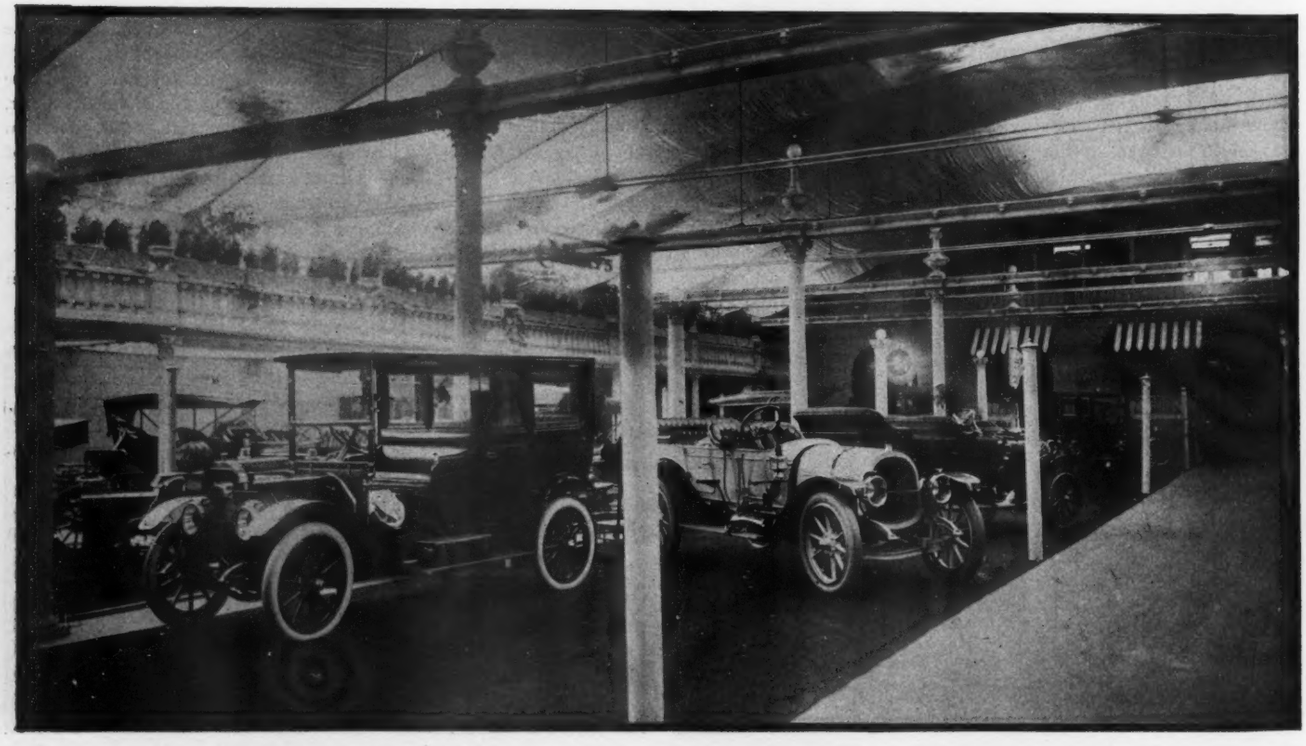
Philadelphia Show Up to Its Standard

PHILADELPHIA, PA., Jan. 14—Simultaneously and without any formal ceremony the tenth annual show opened at 8 o'clock this evening in the First Regiment armory, Broad and Callowhill streets, and the Third Regiment armory, Broad and Wharton streets, presenting a scene that for beauty of decorations and displays of the new models outstripped all former exhibitions. Philadelphia's stamp of approval was indelibly placed on the efforts of the promoters to make the show just what it is—an unqualified success. The opening tonight was the tenth exhibition in as many years, but it differed from others in that it is the first comprising exclusively cars manufactured and sold under the Selden patent and marked the initial effort of the Philadelphia Licensed Automobile Dealers' Association, a young and ambitious association comprising in its membership agents and manufacturers' representatives of all machines sold under the Selden patent.

Weather conditions were more conducive, to say the least, to increase the number of stay-at-homes rather than cause the average person to seek divertisement. But despite the fact that a chilly drizzling rain fell intermittently throughout the day and well into the evening, dyed-in-the-wool motor enthusiasts gathered in force and besieged the several booths seeking at first hand information on the improvements that, while offering no radical departures from last season's models, mark the new designs. Broad street, both north and south of the city hall, presented a scene of the greatest activity, that thoroughfare in the vicinity of the armories presenting a line-up of machines that foretold an attendance exceeding all previous opening nights. Especially did this hold true in the neighborhood of the First Regiment armory, Broad and Callowhill streets, situated in the heart of the row, and cars lined up in the street outside outnumbered those inside the structure.

Show an Attractive One

As to the exhibition itself, everything was done with the single purpose in mind of making it attractive both to the exhibitors and the patrons. The interior of the Third Regiment armory, the larger of the two buildings, presents a scene in entering that cannot fail to commend itself to the most casual observer, chiefly through the attractiveness and the unusualness of the decorations. The general idea all along had been to abandon time-honored schemes in this respect and consequently the big floor imparts an atmosphere that is different. Bare walls and girders have been transformed into a representation of Venice, the scheme being carried out with artistic conception of the subject that leaves nothing to be desired. That the effect might be further enhanced, the



SCENE IN THIRD REGIMENT ARMORY, PHILADELPHIA, SHOWING CHALMERS AND POPE-HARTFORD STANDS

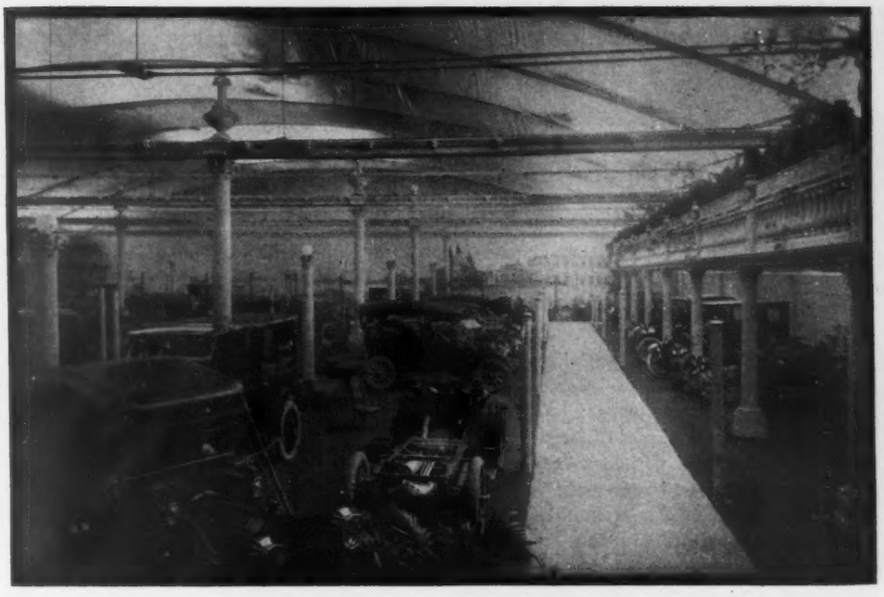
whole is covered with sky. Columns on which rest potted plants dot the aisles, the color scheme being carried out in white. At the uptown armory, the First, the same out-of-the-ordinary clever manipulation of the decorators was depicted. As at the downtown armory all unsightly woodwork was concealed, the interior being altered into the nature of a corridor, all being in white. As has been the custom in the past concerts by the regimental bands afternoons and evenings will feature both shows.

For downright enthusiasm and interestedness this evening's turnout would be difficult of duplication, the show acting as a safety valve to let off the pent-up expectations as to how, being conducted simultaneously in two show places probably two miles apart, the innovation would be received.

Division of the Exhibits

The First Regiment armory is devoted in its entirety to gasoline pleasure cars, while the Third Regiment houses gasoline pleasure cars and the accessories. More attention and space have been allotted the accessories department of the show this year; this necessary adjunct being regarded as an interesting show in itself. Certainly this section this year is one of the most elaborate ever seen here and complete in every detail, occupying the entire space along the southern and the eastern walls of the building and to remain throughout the complete show — 2 weeks. At the First Regiment armory the show closes next Saturday night, the following week being at Broad and Dickinson streets only.

The manufacturers' exhibits of the many



ONE OF THE AISLES IN THIRD REGIMENT ARMORY

Quakers Overflow Two Big Armories

little articles that mean so much and go so far toward the comfort and convenience of touring have their quota of sightseers no less interested than are the students of the finished product. Refinements in accessories that perhaps have no plainly recognizable external differences in characteristics, but that form an important essential to a car, are a feature.

Sections B, C, D, E, F and G comprise the gasoline pleasure car exhibit, the following cars and exhibits being on view: Chalmers, Oldsmobile, Packard, Chadwick, Locomobile, Winton, Royal, Marmon, Elmore, Lozier, Mercer, Pullman, Alco, Marquette, Premier, Brush, Pope-Hartford, Regal, White.

In the First Regiment armory are the Reo, Peerless, Cadillac, Buick, Everitt, Pierce-Arrow, Stearns, Selden, Stanley, Jackson, Marion, Haynes, Cartercar, Mitchell, Knox, Oakland, Palmer-Singer, Kisselkar, Garford, Hudson, Stoddard-Dayton, Courier, E-M-F, Flanders, Stevens-Duryea, National, Hupmobile, Maxwell, Columbia.

GENERAL VIEW OF ONE SECTION OF SHOW IN THIRD REGIMENT ARMORY

Many Exhibitors at the Chicago Show

CHICAGO, Jan. 15—Revised lists of exhibitors at the Chicago show, which opens January 28 in the Coliseum, show that there will be 357 distinct individual exhibits of motor cars, motor cycles and parts and accessories. The sundries exhibits which will be continued from the first week through the second week, or commercial vehicle section, are not counted twice.

Analysis of the exhibitors' list for the Chicago show gives some interesting figures. During the first week, or pleasure car section, ninety-three different manufacturing companies will display complete vehicles and chassis. Thirty-nine of these displays will be on the main floor of the Coliseum, twenty-three in the annex and thirty-one in the First Regiment armory. Eleven of the makers will show electric pleasure vehicles. In the galleries and on the second floor of the annex 175 different exhibitors will show every imaginable article of motor car and garage equipment, supplies, clothing, parts, etc.

During the second week, from February 6 to 11 inclusive, fifty-three manufacturers will exhibit complete motor trucks, delivery wagons, taxicabs, fire apparatus, patrol wagons, ambulances, sightseeing cars, omnibuses, and stages. Six or more different makes of electric industrial vehicles will be shown. Fully one-half of the exhibitors in the commercial vehicle section will show trucks and delivery wagons or commercial chassis that are either strictly new to the market or which never have been exhibited before at motor car shows.

The number of well-known pleasure car manufacturers who have turned their attention seriously to the production of utility machines for the coming year is especially striking. No fewer than twenty-one concerns which will have pleasure car exhibits during the first week of the show will replace these with their own commercial vehicle models for the second week. Prominent among these are the Packard, White, Pierce-Arrow, Peerless, Studebaker, American Locomotive, Knox, Franklin, Waverley, Rambler, Stearns, Reo, Cartercar, Garford, Willys-Overland, and Kissel factories. The Atlas Motor Car Co. has added a light truck to its taxicab and town car models, the Anderson Carriage Co. has brought out a new Detroit electric delivery wagon and changed the name of the company to the Anderson Electric Car Co.; the Alden Sampson Mfg. Co., which formerly made only heavy trucks, has brought out a line of light trucks and delivery wagons and also a pleasure car; the McIntyre Co. makes and will show both pleasure cars and general utility wagons. The Courier Car Co., which will show delivery and express wagons, also makes pleasure cars, as does the Monitor, Metzger and Marquette companies, and probably others also, it is figured.

Immediately following the close of the first week of the show, at 11 p. m. Saturday night, February 4, the exhibitors will begin removing their displays of pleasure cars, which will all be out of the building by 9 o'clock Sunday morning. All the old carpet will be taken up, a rearrangement of spaces made, some of the decorative features moved, and new carpets laid. Then the motor trucks will be moved in so that the commercial vehicle show can open immediately after noon on Monday, the 6th.

All but about fifty-five of the sundries exhibits will be continued through the 2 weeks, but those displayed the first week in the gallery of the armory will be transferred to the Coliseum and annex for the second week. There will also be a dozen strictly new sundries exhibits for the commercial section. Doubtless also many of the companies that retain their spaces will change the goods they display, especially the tire people, showing products especially suited for heavy service vehicles the second week.

OMAHA SHOW PLANS

Omaha, Neb., Jan. 15—Preparations for the sixth annual show of the Omaha Dealers' Show Association, are rapidly nearing completion. The show, which opens February 20, will be divided into three parts. On the main floor of the auditorium will be the pleasure vehicles. In the basement will be the commercial vehicles, and on the stage of the auditorium the accessories exhibit. There will be thirty-eight exhibitors. Nine companies willl exhibit motor trucks and five supplies. Clark G. Powell, secretary of the show association, spent the past week in the east, visiting various factories, and completing preparations for some of the big exhibits. Lack of sufficient space is the only thing that handicaps the dealers now. As there will be some sixty-five different makes of cars exhibited, and each dealer wants to show several models of each car, even the best arrangement of exhibits has failed to provide sufficient room. Posters are being sent out all through this state, Kansas, Iowa, South Dakota and Colorado, advertising the show.

HOOSIERS PICK DATES

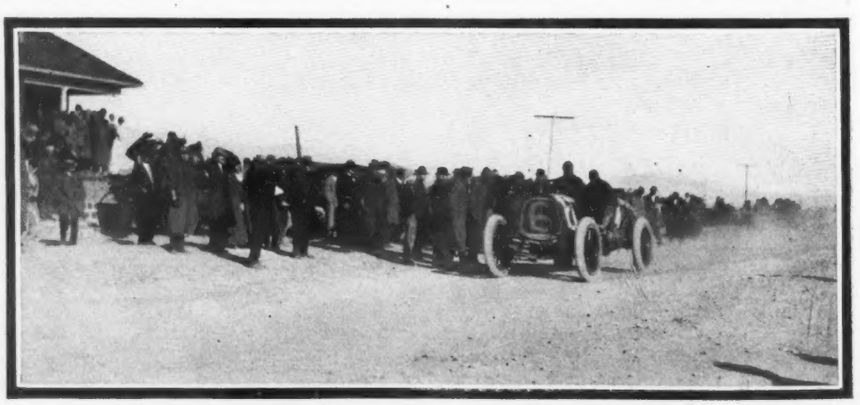
Indianapolis, Ind., Jan. 16—The annual opening or show of local motor car dealers and manufacturers will be held February 27 and 28 and March 1, 2, 3 and 4. As usual, owing to the fact there is no building to accommodate a show under one roof, each concern will exhibit in its own establishment. John B. Orman, chairman of the committee on street events of the association, is planning for a big night parade, to be patterned after the famous mardi gras night parades at New Orleans. There will also be a daylight parade of 1911 models and other features in which all members of the association will participate.

NO ROOM FOR COMMERCIALS

Cleveland, O., Jan. 14—Close on the heels of the announcement that there will be one show instead of two in Cleveland this season comes the news that this arrangement will prevent the exhibition of commercial cars. In previous years even with the holding of two exhibitions it was a difficult matter to find space for all the companies that desired to exhibit. The combining of the rival show companies this year complicates the situation more than ever. As a way out of the difficulty it has been suggested that an exhibition devoted solely to commercial vehicles be held on February 27, 28 and 29, the 3 days following the closing of the first show. This plan is meeting favor with commercial dealers and will very likely be adopted.

CHICAGO TRUCK MEN ORGANIZE

Chicago, Jan. 14—The organization of the local dealers who are interested in the sale of commercial motor vehicles which was formed for the purpose of booming the second week of the Chicago show has been converted into the Motor Truck Association of Chicago which has become a permanent body and which will be patterned after similar associations in Boston and New York. This new association



W. D. Tremaine's Pope-Hartford Which Won 140-Mile Free-For-All at Tucson

was formed at a meeting held Thursday night and the election of officers resulted in the following being chosen: President, Henry Paulman; first vice-president, E. W. Curtis; second vice-president, A. P. Lee; treasurer, James Plew; secretary, L. C. Long; directors, H. P. Branstetter, F. L. Thomas, George Siegmund, L. A. Ferguson, E. Graham Rhodes and W. B. Ingersen.

PARRY SALE APPROVED

Indianapolis, Ind., Jan. 16—Judge Vinson Carter of the superior court has approved the sale made by the Union Trust Co., receiver, of the Parry Automobile Co. to interests represented by W. K. Bromley and G. O. Simons for $50,000. These interests have organized the Motor Car Mfg. Co., which has taken charge of the Parry plant. The new company has been organized and incorporated with an authorized capitalization of $75,000. Between 500 and 600 men will be given employment and 1,000 cars will be made this year. Officers and directors of the company are: President, W. C. Teasdale, Jr., who was vice-president of the Parry company; G. O. Simons, general superintendent and vice-president; Wayne K. Bromley, secretary, and Fred C. Dorn and Frank H. Teagle, the remaining directors.

DISBROW IN LONG RACE

Indianapolis, Ind., Jan. 17—Entries are coming in already for the 500-mile sweepstakes race which will be run on the speedway on May 30, and it now looks as if there would be between thirty-five and forty nominations before the lists finally close. The latest entry is that of Louis Disbrow, who will drive a special Pope-Hartford. This makes the fifth entry, the others being Lewis Strang in a Case, C. B. Baldwin, in an Inter-State 50, Johnny Aitken in a National 40, and a Simplex, the driver of which will probably be de Palma. It is announced that the entries of two Marquette-Buicks will be made this week, one of which will be driven by Burman and the other by Arthur Chevrolet. Immediately after the Indianapolis meet these two drivers, accompanied by Louis Chevrolet, will cross the ocean to compete in the French grand prix.

Good Speedway Meet at Los Angeles

LOS ANGELES, Cal., Jan. 16—Special telegram—Rainy weather marred the motordrome racing Saturday and resulted in the postponement of the Sunday card. Ralph de Palma with his Simplex 90 made a clean-up of the free-for-all events, beating Wilcox in the National by a short margin in the 5 and 10-mile events. The Simplex is an ideal car for the piepan, while the big National was inclined to skid on account of its long wheelbase. The National team carried away the honors in the stock events.

De Palma and Wilcox tied in the time trials for the fastest mile, :39⅘. In the 5-mile race the National led the Simplex by a car's length for 3 miles. Then de Palma jumped ahead and won by several lengths. The 10-mile free-for-all resulted in both cars ripping the treads off their tires, but neither stopped and by taking a greater chance de Palma won easily in 6:52.

The 75-mile race was a duel between the Pope-Hartford, Dingley driving, and Wilcox's National 40. The Pope maintained its lead to the eighteenth mile, when two bad tires caused it to stop. Merz then jumped ahead in the other National, which had been running easily, and won handily in 19:56⅘. Dingley's time for the first 15 miles was 3:47⅘, 7:25⅗, 11:04⅘. The Sunday card will be run next Sunday.

Summaries:

One-mile record trials—De Palma, Simplex, :39⅘; Wilcox, National six, :39⅘.

Five-mile free-for-all—De Palma, Simplex, won; Wilcox, National six, second; Merz, National 40, third; time, 3:26⅗.

Ten-mile, 600 cubic inches and under, stock chassis—Merz, National 40, won; Dingley, Pope-Hartford, second; Wilcox, National 40, third; time, 7:23⅗.

Ten-mile free-for-all—De Palma, Simplex, won; Wilcox, National six, second; Merz, National 40, third; time, 6:52.

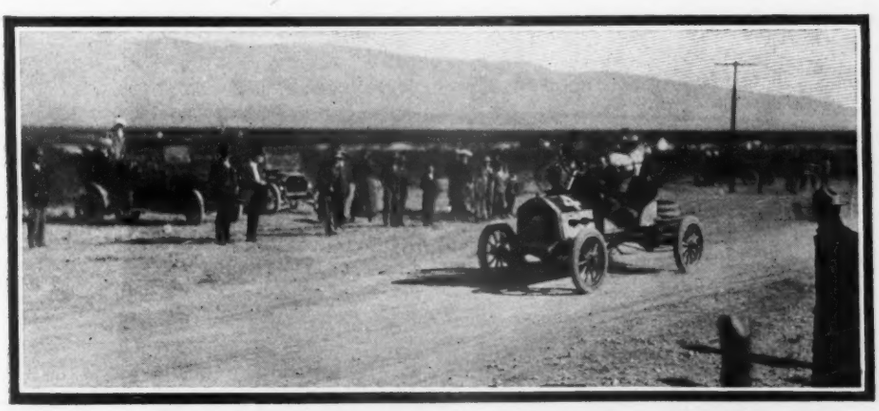
Twenty-five-mile, 600 cubic inches and under, stock chassis—Merz, National 40, won; Wilcox, National 40, second; L. Nikrent, Buick, third; time, 19:56⅘.

DESERT SPEEDWAY MEET

Tucson, Ariz., Jan. 12—A desert motor race meet, the first one of the kind ever held in the southwest, drew thousands of spectators to Tucson on January 2. The Tucson Automobile Club, recently formed, promoted the races, which were held under the sanction of the American Automobile Association. Two A. A. A. officials were present at the meet—George Purdy Bullard of the contest board, and A. Fremau of the technical board. Three events were run varying in length from 42 to 140 miles. Event No. 1, for cars of 201 to 300 cubic inches piston displacement, was won by Dr. F. H. Redewell, of Phoenix, driving his own Pope-Hartford. He covered the 42 miles in the fast time of 50 minutes 16⅘ seconds. W. F. Brong, in a Case, was second. Dr. Redewill also annexed the second race over a distance of 70 miles. This race was also for cars of 201 to 300 cubic inches piston displacement. His time was 1 hour 28 minutes 56⅗ seconds. The big event of the day was the 140-mile free-for-all. W. D. Tremaine, driving a 1909 model Pope-Hartford, annexed the event in the fast time of 2 hours 37 minutes 2 seconds. Dr. Redewill drove his own Pope second, in 3 hours 21 minutes 20⅗ seconds. Five hundred dollars in prizes were awarded to the winners, besides several handsome trophies awarded by L. J. F. Iager, of Tucson.

Considering the fact that the 14-mile course, which is in the shape of a rectangle, was rather soft in places, the time made in each event was considered very fast. The drivers suffered from a cold wind which was blowing all day. Physicians present estimated that the drivers and mechanicians of the contesting cars were subjected to a wind that registered 10 degrees below zero as they drove through it at the rate of over 60 miles an hour. Several of the drivers had to be fairly lifted from their seats at the end of the contests because of the severe cold.

Preceding the races in Tucson, a desert road race, rivaling the great Los Angeles-to-Phoenix contest, was run from Phoenix to Tucson, under the auspices of the Tucson Citizen. The contest was arranged by the Tucson Citizen, which newspaper offered a valuable silver cup for the car making the best time from Phoenix to Tucson. The road measures 131 miles, and lies through a rugged country. Two rivers had to be forded, besides innumerable sand washes and dry creek beds. A Case, W. F. Brong driving, won the race in the remarkably fast time of 4 hours 39 minutes. Harvey Herrick, who drove the Kisselkar to victory in the recent Los Angeles-Phoenix race, will shortly make an attempt to lower this mark.



CASE CAR WHICH WON THE PHOENIX-TUCSON ROAD RACE

OREGON IN LINE

Portland, Ore., Jan. 14—The Oregon Good Roads Association has inaugurated a state-wide movement to secure favorable consideration of five highway measures which are to be submitted to the state legislature at the coming session. A general good roads committee having two members from every Oregon county was appointed the past week.

WEAR ON VALVE-PUSHERS

GLENS FALLS, N. Y.,—Editor Motor Age—Will Motor Age kindly inform the writer why the forward valve-pushers on a four or six-cylinder motor always will show more wear than the rear ones? This is the case in most motors overhauled in our repair shop, especially with the exhaust valve-pushers. The pushers for the forward cylinders invariably show more wear.—E. G. Mertens.

The disposition on the part of the exhaust-valve pushers or valve-lifting mechanisms to wear more rapidly than the inlet valve-lifting mechanisms is due to the fact that they are subject to greater working strains on account of the use of heavier and stiffer valve springs on the exhaust valves of the motor. The inclination of the valves near the forward end of a four or six-cylinder motor to wear faster than those near the rear end, is not characteristic of all motors, but may be a peculiarity of the certain makes of motors most often repaired in your shop. It may be due to insufficient bearing surface or the use of unsuitable bearing material for the front bearing of the camshaft; so that owing to the greater strains on this bearing on account of its having to withstand the direct thrusts or forces of the camshaft gear, the bearing wears excessively and permits of movements near the front end of the camshaft that are not beneficial to the wearing qualities of the coöperating pushrod mechanisms. Motor Age would be glad to hear from other repairmen on the subject or upon similar characteristics in other parts of motors. The names of the motors might also help to clear up matters. It is most likely that the greater wear of the valve-pushers at the forward end of the motor are due to improper lubrication; the oil is, perhaps, better distributed at the rear than at the front of the crankcase.

CARBURATION PROBLEM

Rawlins, Wyo.—Editor Motor Age—I write to inquire which is the more efficient or powerful a carbureter with a hot air intake from the exhaust, or one with a hotwater jacket. It strikes me that for damp, rainy weather the hot air would be the better. In making the supplement with specifications for this season, a great many readers would appreciate it still more if Motor Age would go a little more into detail and give the weights of cars, the clearance from lowest point of front axle, and clearance from lowest point of rear axle. It is quite an advantage to have the clearance the same on both axles in the western country; then if one runs on to a high-crowned road and gets hung up it will be with the front axle and there are the rear wheels to pull the car back, but if the clearance is not the same the rear axle must be dug loose in order to get traction. While this seems a small item it often means an hour or more delay, when touring the country. —H. A. France.

The Readers'

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

All depends upon the efficiency of the design of either the hotwater jacket or the hot air intake from the exhaust. The object of both is to promote vaporization of the fuel liquid. The poor grade of gasoline now on the market makes it almost imperative for the carbureter to have some outside aid in gasifying the mixture. The advantage of the hotwater jacket is that it is less cumbersome, and it is claimed that the heating of the carbureter mixing chamber is more effective than merely heating the incoming air of the carbureter. It is claimed that humid or damp air forms a very suitable and combustible mixture with the fuel of a gasoline motor, and it might seem that whatever moisture there was in the atmosphere would be quite thoroughly dried out in the vicinity of the exhaust pipe, so that any advantages to be gained from the humidity of the atmosphere would be lost.

The weights and clearance of motor cars never have been given in the specification tables because of the difficulty of obtaining reliable information on the subjects.

ERROR REGARDING MOTOR POWER

Kenosha, Wis.—Editor Motor Age—In the November 17 issue of Motor Age, pages 36 and 37, some curves on fan and muffler losses were published, the data for which was obtained in the Rambler laboratory. In the explanatory notes it was stated that the Rambler car was fitted with a 45-horsepower engine, which is true of one Rambler model, but another model is fitted with a 34-horsepower engine, and the data for the muffler losses was obtained some 2 years since on a 34-horsepower engine. The engine on which these tests were made developed approximately 34 horsepower at 1650 revolutions per minute and 31 horsepower at 1300 revolutions per minute which was the maximum speed at which these muffler tests were taken.—F. Purdy.

QUESTIONS FROM AUSTRALIA

Dunolly, Australia—Editor Motor Age—Kindly answer the following questions in the Readers' Clearing House columns:

1—What is the valve-port area in a motor engine? Is it not the circumference of the valve multiplied by the lift?

2—I have frequently noticed larger valves advised as a source of increased power, without any mention being made of increasing the size of the exhaust pipe. Is there any practical use in having the valve port area larger than the area of the exhaust pipe, or is the flow of gases through the valve opening impeded as compared to the flow through the pipe? For instance, in my engine the exhaust valve port area is already the same size as the area of the exhaust pipe. Would I gain in power by putting in a larger valve?

3—In the de Dion car with its narrow exhaust pipe, does a cut-out increase the power?

4—In an air-cooled engine with fan, what is the correct degree of set of the blades of the fan to give the best results?

5—In friction-driven cars, has heavy plate glass ever been tried for the material for the friction disk? I have proven glass to be twice as adhesive as aluminum, but would it stand the strain?

6—Can Motor Age recommend me the best material for friction disks, or is it a trade secret? Aluminum wears much too fast.—Discus.

1—Yes, the valve-port area in a gas motor engine of the poppet-valve type is the circumference of the valve port multiplied by the lift.

2—It is possible that you would gain a little in power if larger valves were used in your motor, but before making any changes, be sure that there is sufficient room for the increase in valve size. Motor manufacturers who have increased the size of their valves have not always increased the valve-port area. The diameters of the valve and valve-port have been increased so that the lift could be proportionately reduced and more noiseless and less vibratory motor operation obtained. Where a gain in power is claimed by increasing the valve-port areas or valve sizes, it is possible that the exhaust pipe was sufficiently large in the first place, or it, too, has been enlarged and no mention made of it. The flow of gases through the valve openings is of course impeded as compared to the flow through the pipe. It depends entirely upon the design of your motor whether or not you could get more power out of it by enlarging the valves. Motor Age would advise you not to attempt the change as the possible gain would hardly be worth the candle, so to speak. The advantage of a larger exhaust pipe is that a more rapid and complete expansion of the gases is permitted, after they have been forced from the cylinder.

3—Yes, a cutout should increase the power of almost any such motor as it not only relieves the pressure in the exhaust pipe and reduces back pressure in the cylinders, but with proper design permits of momentum in the speed of the gases in the exhaust pipe of a multicylinder engine that is claimed to elimi-

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

nate back pressure entirely and even draws out the residual gases that occupy the combustion and valve chambers, creating, as it were, a partial vacuum in these chambers.

4—The angular set of the fan blades depends entirely upon the design of the blades, the speeds at which the fan is intended to revolve, and other conditions. It is generally found by experiment.

5—Motor Age has no record of any instances in which heavy plate glass has been used as a material for a friction disk.

6—It is possible that the aluminum which you have found to wear too fast is of an improper grade, or the friction material used in combination with it is not of the correct composition or design. In the Lambert friction-driven cars, a large aluminum-faced metal disk is used to transmit power by frictional contact with a fiber-tired wheel of similar size, and excellent wearing qualities are obtained by this combination.

SUMMIT COUNTY AROUSED

Akron, O.—Editor Motor Age—I recently noticed an item in Motor Age which stated that Summit county expects shortly to sell bonds in the sum of $27,000 for road improvements. I am very much interested in good roads news, and know of many others who are similarly interested; Summit county has mapped out a comprehensive system of improved roads which probably is not excelled by any county in the state in so short a time. The following additional roads are contemplated for next season or now are in the course of construction: 4 miles of tar filled macadam west of the city on the Medina road; 3 miles of brick pavement southwest of the city on the Barberton road; 3 miles of the same, south of the city on the Manchester road; 1½ miles south on South Main street towards the lake resorts; 1 mile east on the Canton road; while the Hudson road will run north of the city. One can see from the above that we are building out in each direction on our main roads and these will be extended year by year until the county line is reached in each direction, and there connect with the roads the other counties are building in our direction. Summit county has been slow in getting started on the road question, but we now believe we sure are right and are going ahead. Practically all of our improved roads will be brick pavements, of a uniform width of 14 feet, and will have a dirt track on one or both sides, thus making them wide enough for three vehicles to pass each other at any place. These roads are costing from $12,000 to $15,000 per mile, depending on the distance the material must be hauled. Judging them from the wear we are getting from similar pavements in the city of Akron, we believe they will last a generation without any particular repairs. There are pavements in this city which have two or three times as much heavy traffic as the county roads will have, and some of these have been down from 18 to 20 years, and where they have not been torn up for sewer and water trenches, they are in good condition. The motorists in the county together with the farmers' organizations have been hammering our county commissioners for a number of years on the road question, and are now much pleased to see that our persistence is bearing fruit. When the Hudson road is completed we will have a stretch of brick pavement 50 miles in length, extending from West Barberton through Akron, thence to Cleveland and its beautiful parks in the east end.—N. A. Mantz.

SIMPLE AFTER ALL

Tacoma, Mo.—Editor Motor Age—There was a case recently in Tacoma, where a tinsmith was given the contract for tarring the roof of a twelve-story building. He was at a loss to know how to hoist the tar since it was impossible for a man to pull a heavy bucket that distance with any reasonable speed and the job wasn't large enough to warrant the use of a donkey engine. He overcame the difficulty by securely fastening his motor car, a single-cylinder Cadillac, to the building. Jacking up one rear wheel, he attached a drum to the spokes by means of long bolts. The engine operating through the differential in the rear axle turned that wheel twice as fast as if both wheels were jacked up so it was necessary to run in the low gear all the time. At night he merely unbolted the drum, let the wheel down, unfastened the car, took his seat and sailed away home.—R. M. Chambers.

RUST ON METAL BODIES

Elkhart, Ind.—Editor Motor Age—I should like the following information in regard to rust on metal bodies given me in the Readers' Clearing House: I am having a great deal of trouble wherever the body is soldered to kill the rust so that when it is painted, the rust will not come through the paint. I have tried a great many things and would like to have you inform me through your magazine, if possible, what is the best way to handle it from the beginning. I suppose there are preparations on the market that one can put on when the body is first soldered to mill it for all time, but we have been unable to locate them.—R. E. Allen.

Your trouble is due to the fact that the acid around the joints soldered is not properly cleaned off after the soldering has been completed. The joints and metal in the immediate vicinity should be thoroughly sandpapered down to the metal so that all traces of the acid are eradicated, then a heavy coat of good lead applied; that is, several thin coats of lead should be applied, each coat being sandpapered; and the lead should be of a good quality.

CLIMBS PEORIA HILL

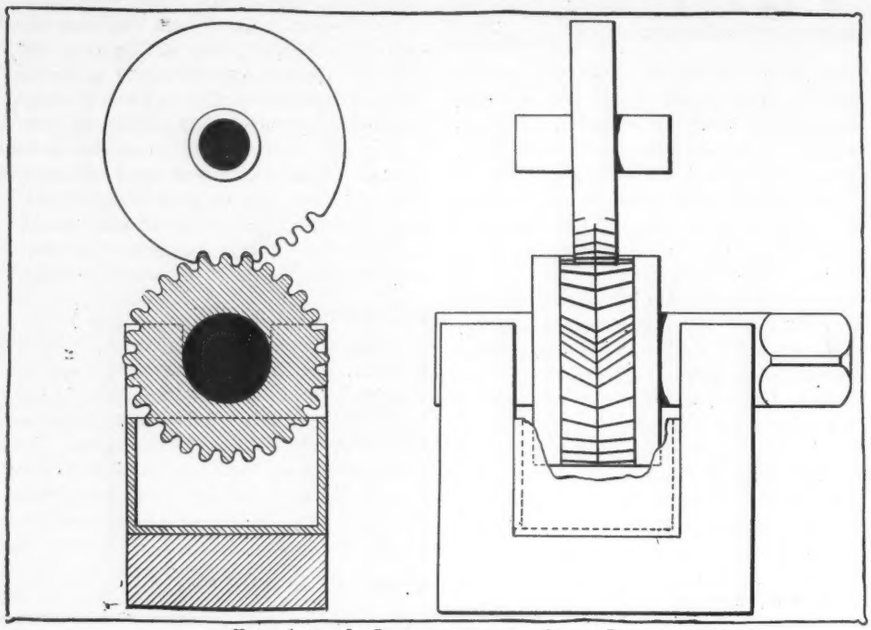
Peoria, Ill.—Editor Motor Age—I noticed in Motor Age, issue December 15, page 28, a short item relative to the Haynes and Staver-Chicago cars climbing the Kickapoo hill, near Peoria, Ill., on high gear. On Friday afternoon, December 16, at 3 o'clock, I drove the same hill with a standard five-passenger 1911 Cadillac car, fully equipped, on high gear.—Rollen Travis.

CHANGES IN THE BUICK

St. Marys, N. B.—Editor Motor Age—Please tell me in the Readers' Clearing House what improvements or changes have been made in the 1911 model 16 or 17 Buick over the 1910 models. Are the brakes in the same place? Are there any changes in the engine, etc?—A. J. Thompson.

There are no radical changes in the 1911 Buick models 16 and 17, but many slight changes in detail and improvements over the 1910 models have been made. As for the motor, improvements have been made on the valve-operating mechanisms to bring about noiseless operation; a centrifugal water pump is used in place of the gear type, and the vertical flat-tube radiator with fins is replaced by a vertical round tube design with plates; a new dual ignition system, and a different carbureter are used; improvements are to be found in the oiling system in that a plunger pump, which permits better regulation of the oil supply, is employed in place of the gear pump; and a foot accelerator is now fitted. A multiple-disk clutch is now used instead of the leather-faced cone type; and the oil supply in the clutch housing is automatically maintained. The gearset is improved so there is less noise when running on the intermediate gears; the gearset brake is eliminated and another set added to the rear-wheel drums; the frame is kicked up more over the rear axle so that more of a straight-line drive is obtained; diagonal strut or radius rods are fitted; and three-quarter elliptic springs are used in the rear instead of elliptics. The wheelbase is increased from 112 to 116 inches; the wheels on model 16 may be 32 by 4½ or 36 by 4 inches at the option of the purchaser, and the wheels on the model 17 are increased in size to 36 by 4 inches. Changes are made in the body styles and the fender designed is improved.

Discussion of Hot Rolled Gears as Used in Motor Industry



FIGS. 1 AND 2—ILLUSTRATING THE COMLY IDEA

EDITOR'S NOTE.—The following paper on hot-rolled gears was prepared and read by H. N. Anderson at the Society of Automobile Engineers' meeting last week.

NEARLY 4 years ago, when the motor car industry was expanding by leaps and bounds and the capacity of the machine tools was the limiting feature, my attention was called to the fact that the shortage of the gear-cutting machinery seemed to be the greatest, and at that time I conceived the idea of rolling the teeth in the rough blank hot, which idea, upon investigation, I found was not new, but which never had been developed to a practical point before.

Development of the Art

The knurling process was always used heretofore, that is, either the die was driven and the blank allowed to turn from its contact with the die, or the blank driven and the die allowed to turn from contact. The idea of rolling gear teeth in a blank first originated with John Comly as early as 1872. Comly shows the die driven and the blank rotating by contact, Figs. 1 and 2. F. A. Brun, a Frenchman, in 1905, showed the construction illustrated in Fig. 3; the blank being driven by frictional contact from the conical rolls 8, and the die 9 allowed to turn from contact with the blank. Brun took care of the surplus metal by the adjustment of the conical rolls, 8, the idea being to force this extra metal down into the web of the gears. Charles H. Logue, who has written a treatise on gearing, experimented with rolling gears; but his method was to take the blank and notch or rough it on a milling or hobbing machine, which gave the correct number of teeth and spacing; then taking the blank, heating it, and rolling the teeth to form. These operations would be more expensive than cutting the teeth to size in the first place.

I then built a small machine and experimented with rolling lead blanks, as the cold lead would flow the same as steel at a forging heat and required but a small amount of pressure. This showed conclusively that the tooth would form itself correctly. A large experimental machine was then built and steel gears, samples of which I have here for your inspection, were rolled successfully.

The machine in itself is very simple, as shown in the plan view. Fig. 4 comprises the driven shaft, which drives through gears 14 and 12, shaft 11. On the end of shaft 11 is the breakdown or roughing gear 13. On the shaft 4 is the finished gear 7; also a timing gear 6, which drives gear 23. This gear 23 is the same size as the blank to be rolled. This blank, marked X, is held between two chucks, 24b and 27b, which are opened and closed by a screw. The whole carriage 15, carrying chuck and gear, is pivoted on the pivot in line with edge of gear 23, and carriage is oscillated by means of screw 20 and handwheel 19.

The Process

The process is as follows: Blank X is inserted and the carriage is thrown over toward breakdown gear 13, which does the roughing work. This operation is very interesting, as the blank to be rolled is a little over the pitch diameter of the gear, the metal being broken up by this breakdown gear and flowed out to a larger diameter. The blank is then brought into contact with finishing gear 7, and carried up until the carriage reaches the stop mark 30; then the proper depth of tooth is reached and also the proper diameter; at the same time the surplus metal thrown out on the end of the teeth is trimmed off by cutter 31 by the movement of carriage by screw, operated by hand wheel or lever, which brings edge of the gear X in contact with cutter 31. The gear is kept in this machine until it takes a permanent set, and is pushed off the holding arbor by a stripping device which cannot distort it.

Some of the Advantages

The advantages of the process are:

First—Cheapness, as the whole periphery of the gear is rolled in one or two heats, depending on the size of the blank. One gets an idea of the rapidity with which these gears can be made from the fact

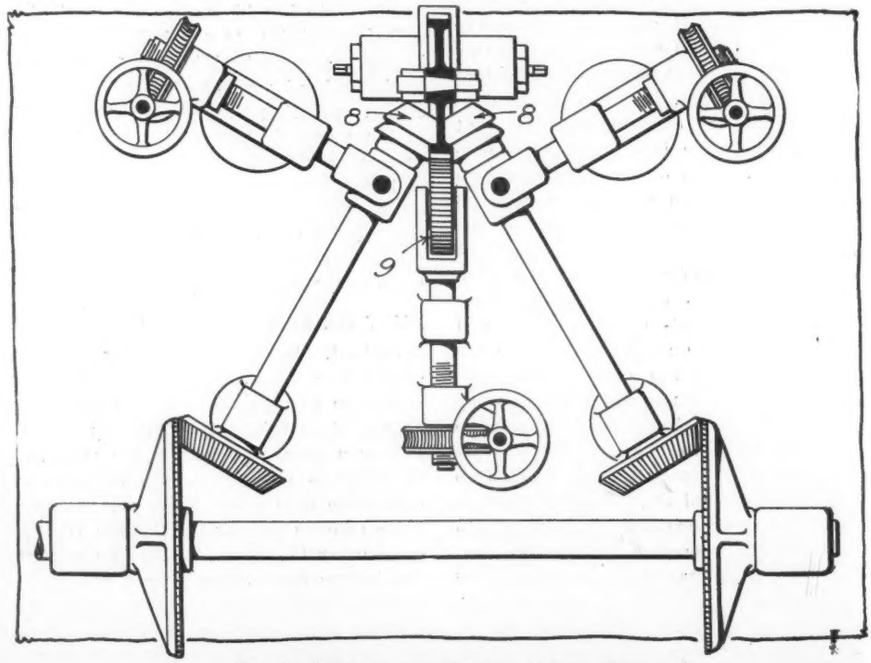


FIG. 3—CONSTRUCTION BROUGHT OUT BY BRUN

that a gear is in the machine for a period of not over 45 seconds.

Second—A much stronger tooth, caused by the increased density of the metal, as each tooth is practically forged by an enormous side pressure on each flank.

Third—A generated and developed tooth.

Fourth—The tendency to warp in case-hardening is a great deal less than with a cut gear, as the structure of the metal at the periphery is changed while hot and there are no internal strains to be relieved, as is the case of the cut gear, the periphery of which has been changed when the metal is cold.

Fifth—Any alloy steel gear, the blank of which can be drop-forged, can be rolled. With some silico-manganese steels which are practically impossible to machine, the blanks can have the teeth rolled and ground afterwards if desired; the hole being ground, making all operations forging and grinding.

Sixth—As the gears are held at the periphery and the hole is bored afterwards on a chuck from the pitch line of the teeth, the hole must be concentric with the pitch diameter, eliminating the possibility of a sprung arbor cutting an eccentric gear.

Applies to Bevel Gears

The rolling process applies to bevel as well as spur gears, in which case the cost is decreased far more.

In roughing a bevel with this process, the sides of the teeth have the true curve, with an evenly added amount of finish allowance. This is in contrast to the ordinary roughing machine, which cuts a straight side on the teeth; the generating machine consequently having to remove more stock in rounding the corners than on the pitch line.

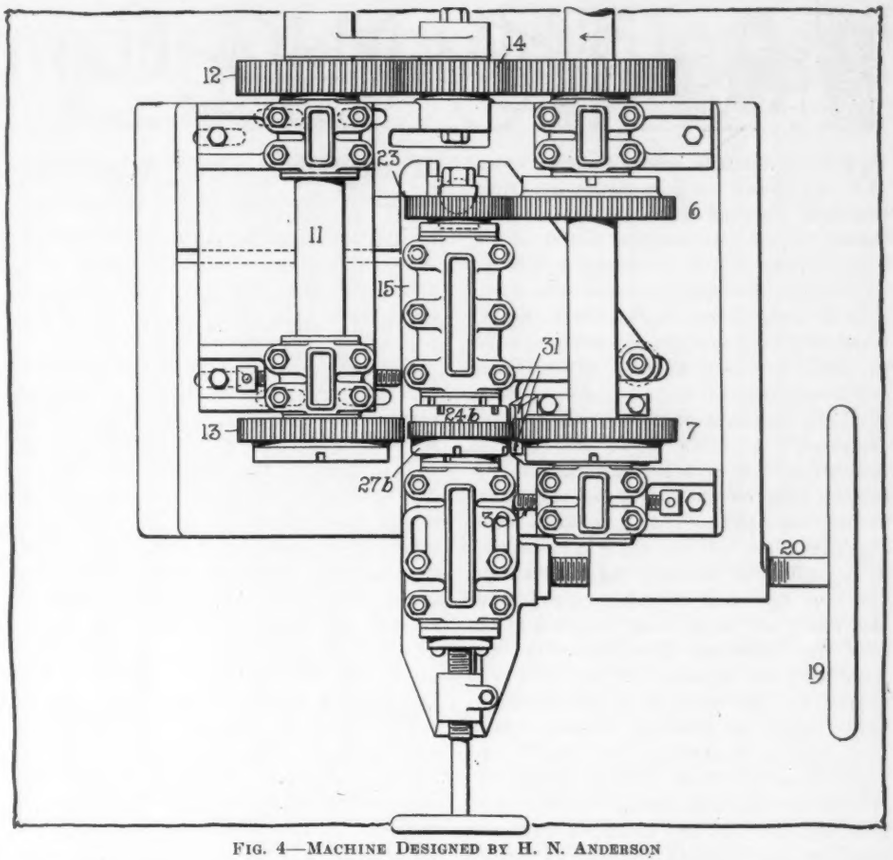


FIG. 4—MACHINE DESIGNED BY H. N. ANDERSON

All gears where high accuracy is desired should have a finishing cut. The process described in combination with the gear grinding machine described by F. A. Ward in a previous paper presented to the society, would give, I believe, a cheaper gear than the present gear case-hardened; at the same time a stronger and an accurate tooth. There is no question but that, with more development of this process, gears can be used in the lower-priced cars without any finishing cuts being required other than running the gears in properly. In connection with the samples, I would call your attention to the absolute freedom of any heavy scale on the teeth. Machines will be in operation on commercial work very shortly. And then the engineers can see how it works.

Recent Motor Car Literature Fine Examples of Printer's Art

R. M. OWEN & CO. have just issued their mid-winter number of their house organ, the Reo Echo. It is a forty-two-page, 7 by 10 brochure, and includes an interesting and timely article on cross-continent motoring by L. L. Whitman; "The Advantages of the New Left-Hand Drive," by Prescott Adamson; "Blazing a New Motor Way Between Little Rock and Kansas City," by A. Lincoln Crayon, a pioneer motorist; "The River-to-River Road," by T. J. Foster, one of the prime movers and supporters of this, the longest stretch of good roads in the country.

"A Real Commercial Truck" is the title of an interesting catalog which the Cass Motor Truck Co., Port Huron, Mich., has issued recently. Its model D in panel, stake, covered express, patrol and sight-seeing types, is described and fully illustrated. The usual parts description and illustrations appearing in a conventional manner.

"This Is the Evidence" is the subject of a booklet from the Grabowsky Power Wagon Co., Detroit, Mich, which consists of fac-simile letters from users of the Grabowsky truck.

The Stutz transmission is described and illustrated in a conventional manner in a twelve-page booklet issued by the Stutz Auto Parts Co.

In a conventional manner the Hartman Electrical Mfg. Co., Mansfield, O., describes and illustrates its line of lamps and wiring system and batteries for motor car electric lighting.

The Lozier Motor Co., New York, has issued an attractive 1911 catalog in which it features and exploits its six and four-cylinder models. Excellent half-tone illustrations of the cars and parts are shown. The book is artistically printed with marginal decorations. A unique idea for guiding a customer in selecting colors for his car is shown on the front end page, in which five ½-inch colored strips extend the length of the page, on top of which and in the center of the page is a disk showing the four Lozier models.

Out of the ordinary is the de luxe catalog of the Locomobile for 1911. It is an artistic creation of 254 pages, dealing with the different models and setting forth by word and picture the many and varied advantages of the Locomobile car. The embossed paper cover, the attractive illustrations, the pen-and-ink sketches are in keeping with the general artistic tone of the book.

The Hartford Suspension Co., Jersey City, N. J., has issued an attractive 1911 calendar 3½ by 8½ inches, which that company is furnishing to the trade in the interest of the Truffault-Hartford shock absorbers.

A new catalog from the B. F. Goodrich Co., Akron, O., calls attention to the merits of the Goodrich wireless tires for motor trucks. This catalog is garbed in an attractive embossed brown cover and is printed in brown to carry out the idea.

The Motor Car Repair Shop

Hints for the Amateur

WHEN a motor begins to show a loss of power, or a misfiring developes, the first possible cause to be suspected should be the compression, for it is the most readily tested, it being merely required that the operator crank the motor over a number of times slowly, noting whether or not the compression is weaker in some cylinders than in others, or a trifle wanting in all. These symptoms generally indicate that the valves need attention. A valve may leak, due to more than one cause; if adjustable, the cap or nuts on the push rod may have become loose and moved up or down, holding the valve off the seat or retarding its opening and closing; the head of the valve or the stem may be warped from the heat; or, as is most commonly the case, the valve seat is pitted or covered with a carbon deposit. If the trouble is caused by the lack of adjustment, the valve should be removed, cleaned, examined, and if in good shape replaced and adjusted so that there will be a clearance of 1-32-inch between the end of the valve stem and the push rod if tested while the motor is cold, or from .008 to 1-64-inch if tested while hot.

A valve whose head is warped or whose stem is bent should be replaced with a new valve. A bent valve may be satisfactorily straightened and a warped head trued up in a lathe; but when this warped condition has been brought about by the heat of the motor a straightening or truing up process of this sort will not remove the something in the stock from which the valve is made, which is the primary cause of its warping. On the other hand, the material of a valve may be quite uniform in structure and temper, but its position in the valve chamber and the relative position of the valve chamber to the combustion chamber of the cylinder may cause one portion of a valve head to be subject to much more heat than the other.

For the valve that is pitted, grinding is the proper treatment. After having scraped the carbon from the valve chamber and seats, and before grinding, it is well to block up the entrance to the cylinder with cloth to catch any particles of emery that otherwise might enter and score the cylinder walls and pistons when the motor is again put into action. To grind in a valve which is badly pitted it is well to begin with rather a coarse grade of emery. Apply a coat of cylinder oil to the face or seat of the valve, distributing it with the tip of the finger; then dip the oily finger into the emery and apply that which adheres to it to the seat on the valve. Be careful to keep the stem clean, so the guide will not be enlarged. If a screwdriver or plain valve grinding tool is to be used, the operator should hold the valve grinding tool in one hand, take hold of the valve stem with the other, assume as comfortable a position as possible, and begin the grinding operation. This is done by turning the valve about a half revolution back and forth on its seat in the cylinder by means of the tool in the one hand, and occasionally lifting the valve from its seat and shifting it around with the other. The valve should be lifted about ⅛ to ¼ inch every five or six reversals to keep the oil and emery well distributed. The pressure on the tool should be slight. Every few minutes the valve should be removed, the seats cleaned off and examined, and a new solution of emery and oil applied.

When the pits are almost removed continue the operation with flour of emery instead of the coarser grade; remove the valve oftener, applying more oil and less emery each time, until a good seat is obtained all around; then finish up by polishing the seats with oil only. Kerosene is most effectively used in finishing the seats of a valve, and the higher the polish obtained the less chance for a carbon deposit.

In Fig. 1 is shown a means employed in the Franklin agency in Chicago for testing valves in the heads of Franklin cylinders. The equipment consists of plates P and P1, asbestos gaskets G and G1, and a nipple N, which forms an attachment for the hose of the air pump A. The plate P is bolted on to the base of the cylinder with the packing G arranged as indicated, while the plate P1 and the gasket G1 are used to close the auxiliary exhaust port. The nipple N, which is comprised of the shell portion of a spark plug, and the threaded portion T of a tire valve that is soldered into it, is screwed into the spark-plug opening of the cylinder and the hose of a tire pump attached to it. The cylinder head is then lowered in a pail of water as indicated at the right of Fig. 1, and air pressure applied to the cylinder. If the valves leak a mass of bubbles will arise as indicated in the drawing, and if there are no bubbles the repairman is assured that the valves seat properly and the motor should hold compression as far as the valves are concerned. In a water-cooled motor, of course, the plate PI is unnecessary.

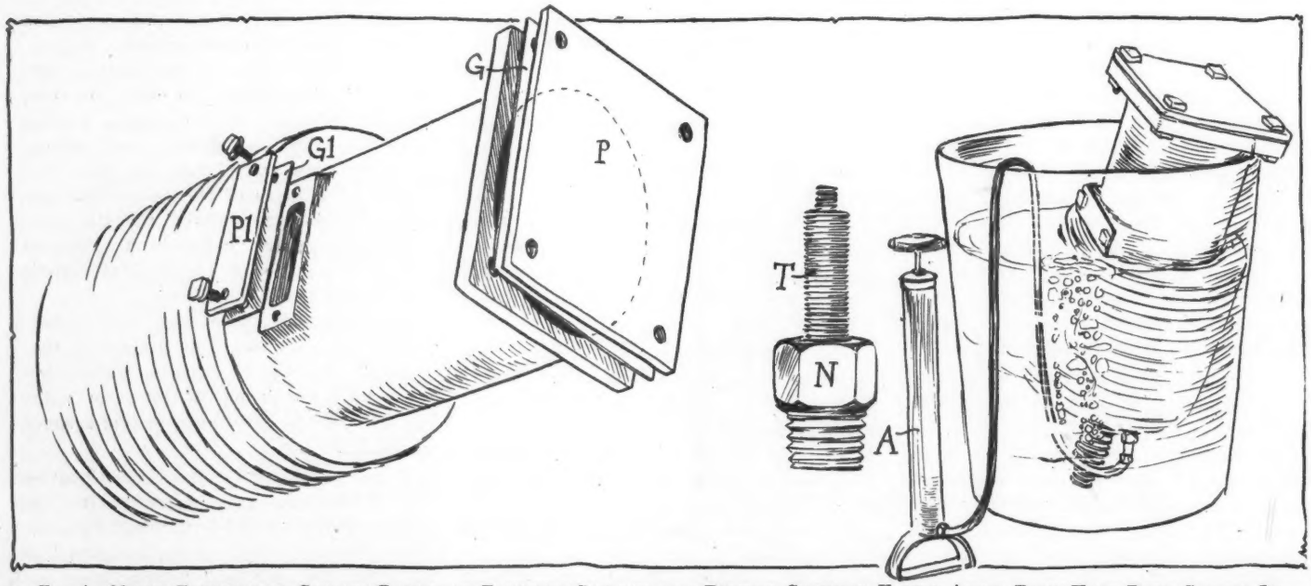


FIG. 1—MEANS EMPLOYED IN CHICAGO BRANCH OF FRANKLIN COMPANY FOR TESTING CYLINDER VALVES AFTER THEY HAVE BEEN GROUND IN

Current Motor Car Patents

NEW Sliding-Valve Motor—No. 979,082, dated December 20; to Robert Miller, New York, N. Y.—This patent relates to a new four-cycle type of sliding-valve motor in which a single sliding sleeve governs the opening and closing of main and auxiliary exhaust ports and the inlet port. The design is illustrated in Fig. 1, and comprises a waterjacketed cylinder with a detachable head, a sliding sleeve S, arranged between the piston P and the cylinder wall, and means for operating the piston and sleeve, and igniting the charges. The engine is so timed that the slots E and A in the sliding sleeve register with the respective main exhaust ports X at the upper end of the cylinder and with the auxiliary exhaust port XI at the bottom of the cylinder, to permit the exhaust gases to escape; and the incoming charges are admitted when the slot T which is located opposite and a little above the auxiliary exhaust port, registers with the inlet port I of the cylinder. The main exhaust port at the upper end of the cylinder consists of an annular passage in the cylinder wall which is thoroughly waterjacketed, and which should give an unusually large port area. The waterjacket extends down to the bottom of the working portion of the cylinder so that all valve ports should be properly cooled. The sleeve-valve of each cylinder is operated by means of a connecting rod driven from an auxiliary half-time crankshaft; and the auxiliary crankshaft gear is driven by a gear on the main crankshaft.

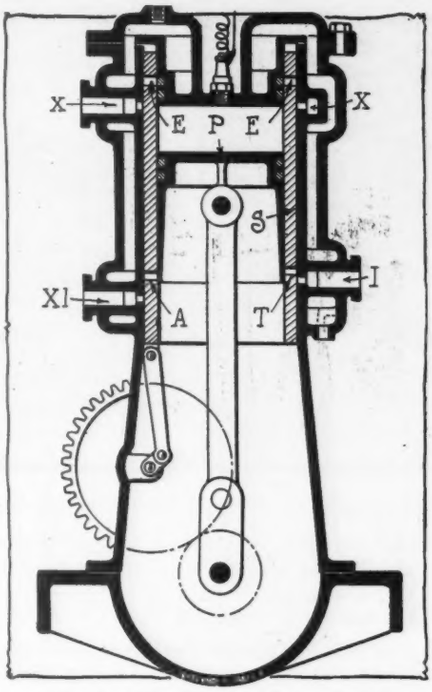


FIG. 1—MILLER'S SLIDE-VALVE MOTOR

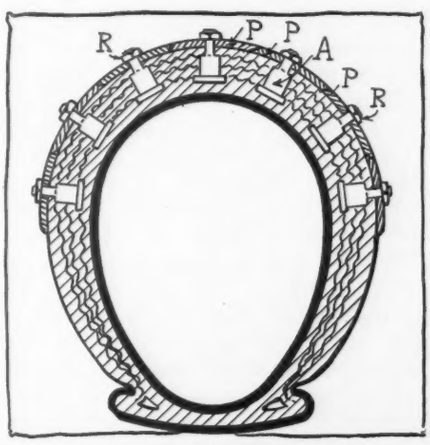


FIG. 2—VITELLO'S ARMORED TIRE

Mechanical Electric Horn—No. 979,246, dated December 20; to Oscar C. Arlitz, New York, N. Y.—As shown in Fig. 3, this patent covers a mechanical electric horn embodying a flexible diaphragm D carrying an impact member I, a hammer member M adapted to engage the impact member and flex the diaphragm, and a small electric motor E to impart a rotary movement to the hammer member on a plane parallel to the diaphragm. The impact member I of the diaphragm is in reality provided with a series of impact members which are struck by the nipples on the hammer member M as it revolves at speed. This striking of the impact members in rapid succession causes vibration of the diaphragm and produces the warning sound characteristic of this type of horn. This instrument may be operated by an electric button conveniently placed on the steering wheel or elsewhere, and the current required may be obtained from a storage battery, or electric generator if one is used on the car. Another horn built upon the same principle but differently constructed is illustrated in Fig. 4. This is covered by patent No. 979,245, to the same inventor. In this construction there are two diaphragms D and DI arranged parallel to the shaft of the motor, and at right angles to the hammer member H on the end of the shaft of the electric motor E. There are buttons in the center of the diaphragms which are struck simultaneously and in rapid succession by the ends of the revolving hammer member, to produce the required vibration; and the diaphragms and operating mechanism are contained in a resonating chamber C having an exit X for the outlet of the sound produced by the horn.

An Armored Anti-Skid Tire—No. 977,492, dated December 6; to Joseph A. Vitello, Abbeville, La.—This patent relates to an armored tire design, a section of which is illustrated in Fig. 2. The armament consists of bow-shaped plates P having lapping edge portions. These plates are secured to angular projecting portions of anchoring devices A, embedded at their inner ends in the fabric of the tire; and they are held in place by nuts or rivets R, which form the anti-skid feature of the tire. The members A are also flanged at their inner ends, below the layers of fabric, indicated by the wavy lines.

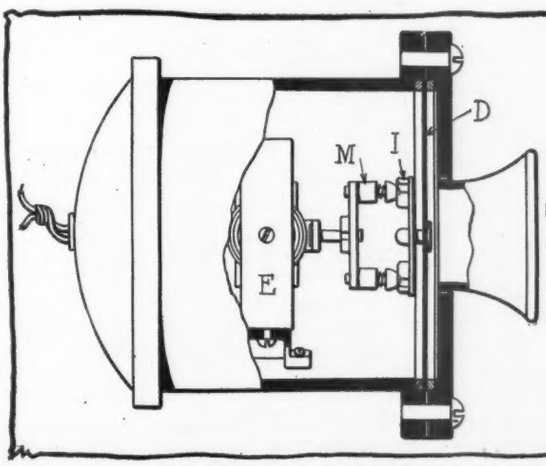


FIG. 3—MECHANICAL ELECTRIC HORN

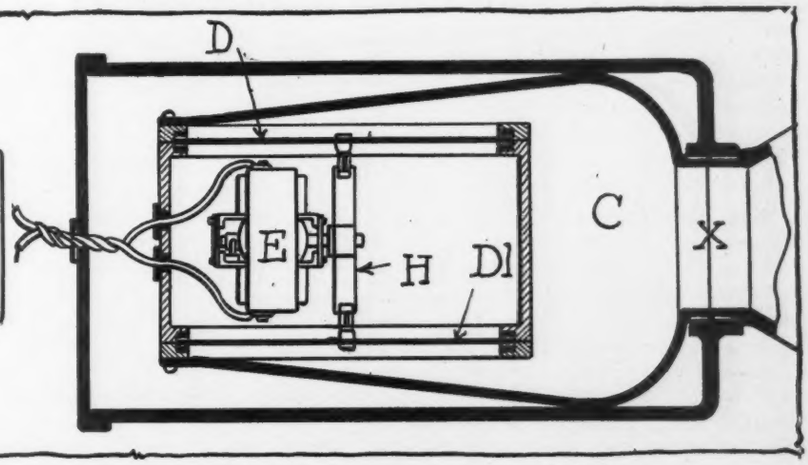
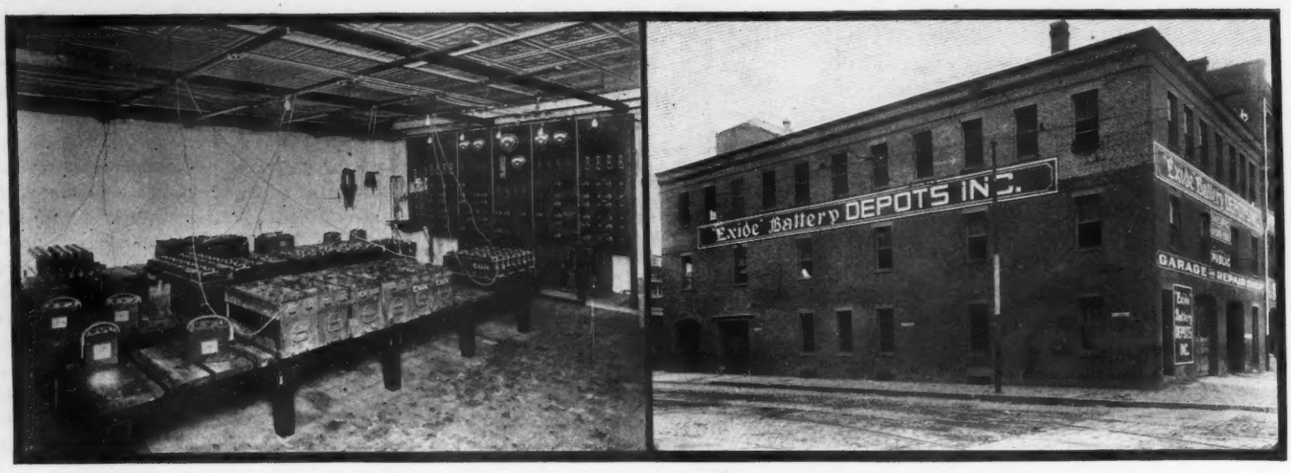


FIG. 4—ANOTHER MECHANICAL ELECTRIC HORN INVENTED BY O. C. ARLITZ

Among the Makers and Dealers



BOSTON DEPOT OF ELECTRIC STORAGE BATTERY CO., WHICH HANDLES EXIDE BATTERIES

REPRESENTS Firestone — The new Firestone branch store at 1239 South Olive street, Los Angeles, has an equipment which provides for every requirement in the sale and repair of pneumatic and solid tires.

Will Maintain Prices—The Weed company announces that the price of its tire chains will be maintained as at present until May 1. At about that time there will be announced a profit-sharing idea, which is being prepared for the dealers' benefit.

Blanchard Joins Firestone—Frank E. Blanchard has been appointed assistant sales manager of the Firestone Tire and Rubber Co., and will make his headquarters at the factory in Akron. Mr. Blanchard leaves the Whitman & Barnes Mfg. Co., of which he has been general sales manager 16 years, previously having had charge of the rubber tire sales.

Exide Boston Depot—In 1902 the Electric Storage Battery Co. opened its first Exide depot in Boston in order to care for its customers in the matter of securing batteries, battery parts, battery attention, and charging. During the early part of this season the company removed to 789 Tremont street, where present quarters are located. In this location the company has 100 per cent increase in floor space; 125 per cent increase in capacity; and 150 per cent increase in stock accommodations.

New Velie Company—License to incorporate has been issued to the Velie Engineering Co., of Moline, Ill.; capital stock, $200,000; incorporators, Willard L. Velie, Lawson M. Fuller, Otis E. Mansure; object, manufacturing electric motors, engines and motor cars. The new company will operate the Velie factory recently constructed in Moline, described in a late issue of Motor Age. The factory building has been completed by the Leonard Construction Co., of Chicago, but machinery has not yet been set in position, and it is not known when the actual operation of the new plant will be begun.

McFarlan, Not a DeTamble—An illustration in the January 5 issue of Motor Age was that of a McFarlan, and not a DeTamble, as was stated. The McFarlan shown was one of the new fore-door type made by the McFarlan Motor Car Co., Connersville, Ind.

New Hupmobile Branch—The Hupp Motor Car Co. announces the establishment of a sales and service branch at Thirty-fourth street and Broadway, Kansas City, Mo. The branch will be in charge of Christian & Co., as managers. This branch will handle a portion of the states of Missouri, Kansas, Texas, Oklahoma, and New Mexico.

Des Moines Prepares for Show—The Des Moines Automobile Dealers' Association held its annual meeting last week and started preparations for the annual show which is to be held in the Coliseum March 7 to 11. W. E. Moyer was elected president, C. G. Van Vliet, secretary, and C. R. Prouty, treasurer. The directors are: T. J. Williams, C. G. Van Vliet, R. J. Clemmons, C. R. Prouty and W. W. Sears.

New Electric Car Concern—A new motor car company for the manufacture of electrics has been organized in Jackson, Mich., the stockholders being with one exception prominent men of that city. The company has incorporated under the name of the Standard Electric Car Co. and is capitalized at $100,000. Charles G. McCutcheon and Frank W. Gay, president and secretary-treasurer of the American Gear and Mfg. Co., have been the most active in perfecting the organization and interesting the capitalists who have subscribed for the stock. The company will manufacture two models, the designs now being perfected. The officers of the company will be as follows: Charles G. McCutcheon, president; C. P. Koueger, vice-president; Frank W. Gay, secretary and treasurer.

Sells Everitt Stock—The H. J. Koehler S. G. Co., with branches at New York, Boston, Brooklyn, and Newark, East Orange, Paterson and Montclair, New Jersey, originally one of the largest stockholders in the Metzger Motor Car Co., of Detroit, Mich., manufacturer of the Everitt car, has sold its interests in that company and has given up the Everitt agency. The Koehler company will continue to control the sale of Hupmobiles in all of

The Show Circuit

January 14-25—Show in Brussels, Belgium.
January 14-28—Show of Philadelphia Automobile Dealers' Association, Philadelphia, Pa.
January 16-21—Second week of A. L. A. M. show in Madison Square garden, New York.
January 16-21—Show in Wayne pavilion, Detroit.
January 14-18—Show at Milwaukee, Wis.
January 25-28—Show in Auditorium, St. Paul, Minn.
January 27-February 4—Show at Vancouver, B. C.
January 28-February 4—First week of national show in Coliseum, Chicago.
February 1-4—Show at Worcester, Mass.
February 5-11—Show at Buffalo, N. Y.
February 6-11—Second week of national show in Coliseum, Chicago.
February 9-12—Show at Davenport, Ia.
February 13-18—Show at Winnipeg, Canada.
February 13-18—Show of Kansas City Motor Car Trade Association.
February 13-18—Show at St. Louis, Mo.
February 13-18—Show in Convention hall, Washington, D. C.
February 15-18—Show at Grand Rapids, Mich.

the New England states, the greater part of New York state and part of Pennsylvania. In future, in addition to the Hupmobile, it intends bending its efforts toward the sale of commerical cars.

Wrong Stroke Given—A typographical error was responsible for the statement published in Motor Age, issue of January 5, that the stroke of the Inter-State motor on the new 50 model was 5 inches. It should have been 5½.

Oil Companies Merge—The New York Lubricating Oil Co. has effected a consolidation with the Columbia Lubricants Co., of New York, and has opened a direct branch office in Chicago at 1436 Michigan avenue, which is in charge of W. M. Crotty and where Monogram oil is to be handled.

Enlarging Cutting Plant—Work was begun Monday on the handsome new Clarke-Carter shops at Jackson, Mich. The new building will be erected on the site of the present property used by the firm and will supplement the already large shops. The building will have three stories and a basement and will be of mill construction, with flat, gravel roof. Its dimensions will be 50 by 160 feet. The basement will be used for blacksmithing. Final assembling work will be done on the first floor, which also will be used as the shipping room. First assembling work will be done on the second floor. The new shop will be light and sanitary, only the best of materials entering into its construction. The present shops will be used in conjunction with the new ones, and more men will be employed. A short time ago the firm built a new stockroom, 40 by 75 feet, and since that time has taken on additional space, giving the shops a great deal more room, but still not enough. When the new shop is finished the firm will have more than 125,000 square feet of floor space and will be enabled to turn out ten to twelve cars a day.

Changes at Rapid Plant—Several important changes have been made recently in the management of the Rapid Motor Vehicle Co., of Pontiac, Mich. F. C. Frank, who has been chief engineer at the Rapid for the last 3 years has been appointed factory manager by General Manager G. A. Horner. David Moreland, who has been for years superintendent at the Rapid, has been promoted to assistant factory manager.

Chance for Makers—The bureau of manufactures of the department of commerce and labor at Washington is establishing a file of the names of American manufacturers and traders, for use in distributing the valuable information which reaches it from time to time in regard to foreign trade. Those who desire to avail themselves of the facilities thus offered for extending their trade abroad should send to the bureau their names and advise it as to the class of business in which they are engaged.

Gramm Finishes Moving—Practically all of the departments of the Gramm Motor Car Co. have been moved from Bowling Green to Lima, Ohio, the location of the new factory. The last departments to be moved were that of the tool department, with R. L. Swartz, manager, and the body department with R. C. Waltz, in charge The forge and motor departments had been moved a week previous. The general office force of the concern was moved before the first of the year. The sales department had been directing sales from the Lima office for some time. The Gramm company has installed a kitchen in the engine house and all employees of the company are expected to take their noonday lunch at the plant. The food will be sold to the employees at cost.

New Staver Agent—The Staver Carriage Co., of Chicago, has established its Chicago agency with F. Benjamin, who will locate at 1466 Michigan avenue. Mr. Benjamin is a large stockholder in the Chicago Taxicab Co.

Supply House Sold—The business heretofore conducted by the Excelsior Automobile Supply Co. at 1436 Michigan avenue, Chicago, has been sold to the Excelsior General Supplies Co., which will continue at the same place, with Harry W. Cooper remaining as manager.

New Findlay Officials—Directors and officers were selected last week by the Findlay Motor Co. stockholders, the directors being as follows: Dr. N. L. MacLachlan, L. C. Glessner, M. D. Neff, M. J. Rudolph, and L. E. Ewing. The directors then elected the following officers: President, L. E. Ewing; vice-president, M. D. Neff; secretary, M. J. Rudolph. The Findlay company is at Findlay, Ohio.

In Its New Plant—The Four-Wheel Drive Auto Co., of Clintonville, Wis., started operations in the former Besserdich-Zachow machine shops on January 1. At a meeting of the directors last week plans for the new factory were adopted, and work will be rushed. The main building will be 120 by 60 feet, one story high, with a boiler house 30 by 40 feet, all of solid brick construction and saw-tooth roof. The concern is building a motor car with power applied to all four wheels, but in a different manner than in the four-wheel drives employed by other concerns in the past. It is the invention of William Besserdich, of Clintonville.

For This Winter

February 14-19—Show at Dayton, O.
February 18-25—Show at Minneapolis, Minn.
February 18-25—Show at Binghamton, N. Y.
February 18-25—Show at Brooklyn, N. Y.
February 18-25—Show at Newark, N. J.
February 20-25—Show at Omaha, Neb.
February 20-25—Show at Cincinnati, O.
February 20-25—Show at Baltimore, Md.
February 22-23—Show at Bloomington, Ill.
February 24-27—Show at New Orleans, La.
February 25-March 4—Show at Toronto, Canada.
February 27-March 4—Show of Kansas City Automobile Dealers' Association, Kansas City, Mo.
February 27-March 4—Show week at Indianapolis, Ind.
February 27-March 4—Show at Sioux City, Iowa.
March 4-11—Show at Boston, Mass.
March 6-11—Show at Des Moines, Ia.
March 7-11—Show at Des Moines, Ia.
March 13-18—Show at Cedar Rapids, Ia.
March 14-18—Show at Syracuse, N. Y.

NEW BRANCH OF FIRESTONE COMPANY IN LOS ANGELES, CAL.

Recent Business Announcements

SYRACUSE, N. Y.—W. F. Horton will represent the Stoddard-Dayton in this city.

Louisville, Ky.—The J. I. Case Threshing Machine Co. has established a branch at 1317 West Main street.

Houston, Tex. — A garage has been opened up here, on Morton street, by Mr. Anderson, who formerly was connected with the Buick Auto Co.

Columbus, O.—Burroughs & Wolgamott have opened a new garage at 186 East Fourth avenue in a new building constructed of cement block.

Birmingham, Ala.—W. J. Thompson has bought out the interests of Lee Higdon and Hinds Peevy in the Automobile Trading Co., of which he will take charge at once.

Brooklyn, N. Y.—The Woods Automobile Co. has opened new salesrooms at 431 Lafayette avenue and will handle the Oakland. The firm is composed of J. R. and T. H. Woods.

Columbus, O.—The DeTamble Auto Co. has been organized in Columbus to handle the DeTamble line in central Ohio. The salesrooms and offices are located at Sixth avenue and High street.

Pittsburg, Pa.—The West Penn Automobile Co. has secured the agency for the Bergdoll and the Detroit electric and has opened for business in its new building at 4922 Centre avenue, east end.

Oregon, Wis.—Keller & Criddle have started work on the construction of their new garage. This concern will be a branch of the Hokanson Automobile Co., of Madison, Wis., and will distribute the Buick, White and Oldsmobile.

Louisville, Ky.—The Southern Motor Sales Co., distributor of the Cole, has added a service department. The new building, which includes a garage and repair shop, is located near the salesroom at Third avenue and Breckenridge street.

Pittsburg, Pa.—The Pennsylvania Motor Sales Co., with offices at 1107 Commonwealth building, has secured the agency for the Garford cars and trucks. Its manager, C. F. Rankin, is arranging for locating a garage and salesroom in the east end of the city.

Chicago—John Kelly, vice-president of Thomas Kelly & Brothers, together with his three sons, John Kelly, Jr., Raymond J. Kelly and Harry Kelly, are building a garage at Madison street and Humphrey avenue, Oak Park, with a capacity for 100 cars. The show room will have a plate glass frontage of 125 feet. The firm will be known as John Kelly & Sons, and will handle a line of pleasure and commercial cars.

Columbia, S. C.—The E. A. Jenkins Motor Co., agent for the E-M-F, is located in North Columbia, on Hyatt Park road.

Madison, Wis.—The Monona Motor Car Co. has been appointed general agent for Wisconsin for the DeTamble Motors Co., of Anderson, Ind.

Pittsburg, Pa.—The Pittsburg Chalmers Co., which is now located at Centre and Norwood avenues, will move into its large new headquarters at 5914-18 Baum street, east end.

Toledo, O.—Harry L. Gordon, formerly of Franklin, Pa., has secured the agency for the DeTamble, and has opened salesrooms with the Standard garage, on Ontario street.

Milwaukee, Wis.—The Winton Motor Carriage Co., an Ohio corporation with a capital of $806,900 and interests amounting to $25,000 in Wisconsin has filed articles and a statement to do business in this state.

Indianapolis, Md.—The Premier Sales Co., which has been at 233-235 North Pennsylvania street, has moved to new quarters at 312-318 North Delaware street. The Regal Motor Sales Co., formerly in North Delaware street, has moved to 121 and 125 South East street.

Kansas City, Mo.—The Cino Auto Co. has been incorporated with a capital stock of $10,000. D. S. Bettig is president; William Lingle vice-president, and A. D. Kirkpatrick secretary and treasurer. The company has opened salesrooms at 924-26 East Fifteenth street.

Akron, O.—A. L. Siegrist, who has been with the Swinehart Tire and Rubber Co. during the past 7 years, has resigned his position with that firm, to accept a position as traveling representative for the truck tire department of the Republic Rubber Co., with headquarters at Detroit.

Warren, O.—The Warren Motor Sales Co. has been organized at Warren, with Bert O. Weed as general manager and sales agent. The company has established headquarters in the Gilmore Wallace block and will have the Trumbell county agency for the Henry, Warren and Paige-Detroit cars.

St. Louis, Mo.—The Weber Implement and Automobile Co. has moved from its quarters on North Main street to the new location at Nineteenth and Locust streets. The building has been completely remodeled a third story added, and is now modern throughout. The total floor space is 32,000 square feet. In addition to the Lozier and Mitchell lines, it will handle the Rapid and Reliance trucks. George Weber is general manager.

Baraboo, Wis.—Marquardt Brothers, of Baraboo, has leased the garage at 323 East Wilson street, Madison, Wis., and will establish an agency.

Montreal, Can.—The Hill Motor Co. of Canada, Ltd., has opened new salesrooms at 626 Catherine street, west, where it will handle the Moon and Krit cars.

Coraopolis, Pa.—The Coraopolis Garage Co., capital $6,000, has been formed at Coraopolis by H. M. Thompson, J. H. Thomas and Carl and W. F. Venter.

Akron, O.—The Portage Rubber Co. has been authorized by the secretary of state to increase its capital stock from $10,000 to $1,000,000. New officers will be elected in March. Temporary officers are acting now with H. M. Hagelbarger as president. The company will double the capacity of its reclaiming plant, that of the United Rubber Co., at Barberton.

Louisville, Ky.—Announcement has been made by the American Automobile Mfg. Co. of this city, maker of the Jonz car, that the concern had closed a contract with C. D. Norris, superintendent of the Studebaker Automobile Co. of South Bend, Ind., who takes the position as superintendent of the local manufacturing plant at New Albany.

Milwaukee, Wis.—Paul G. Niehoff, formerly western representative of the Garage Equipment Mfg. Co., has resigned his position to assume the management and presidency of the Rie-Nie Mfg. Co. of Minneapolis, Minn. Henry Niehoff, secretary of the Garage Equipment Mfg. Co., however, still retains his identity and interest in the company. R. C. Peete will take charge of Mr. Niehoff's territory and act as general traveling representative of

Recent Incorporations

Rochester, N. Y.—Rochester Accessory Mfg. Co., capital stock $10,000; to manufacture motor car accessories; directors, Max A. Adler, Milton S. Adler and E. F. Talmitch.

Houston, Tex.—Mitchell Co. of Texas, capital stock $5,000; handle motor cars and accessories; incorporators, F. J. Rowan, W. J. Moroney and J. R. Golden.

Houston, Tex.—Amarillo Auto Supply Co., capital stock $20,000; incorporators, M. C. Menasters, T. M. Hand and W. A. McSpadden.

St. Louis, Mo.—Chicopee Motor Car Co., capital stock $3,000; to manufacture and deal in motor cars; incorporators, H. C. Carr, F. V. Carr and J. J. Blincoe.

Salt Lake City, Utah—Arvis Motor Co., to manufacture motors and accessories; incorporators, Reinold V. Smith, J. Fewson Smith, J. V. Smith, A. Milner and W. S. Bing.

Chicago—National Motor Devices Co., capital stock, $30,000; to manufacture, buy and sell motor car devices; incorporators, C. O. Garmire, P. Leviton and J. H. Hoglund.

Concerning the Motor Industry

the Garage Equipment Mfg. Co., covering the entire United States and Canada, with headquarters at Milwaukee.

Mineral Point, Wis.—John J. Penhallegon has opened a garage and will handle the Elmore in Iowa, Lafayette and Grant counties.

Syracuse, N. Y.—The A. A. Ledermann Co. has opened offices at 123 Rosenbloom building, Salina street, Syracuse, N. Y., for the sale of Pierce-Arrow motor cars.

New York—A branch establiishment for the sale of Jelco tires and tubes has been opened at Broadway and Fifty-seventh street, with Frank P. Hayes as manager.

Pittsburg, Pa.—The East Liberty Automobile Co. has been organized in Pittsburg by J. Joe Feicht, Joseph Goldsmith and Frank R. S. Caplan and will have a garage in the east end.

Beloit, Wis.—The Cram garage to be the new home of the James Menhall Motor Co., has been completed. The second floor, to be occupied by the Beloit Elks' lodge, will be ready March 15.

Youngstown, O.—Thomas L. Robinson, who has been connected with the Dollar Savings and Trust Co., Youngstown, O., for some years, has been elected chairman of the board of directors of the Republic Rubber Co., succeeding the late Warner Arms.

Sandusky, O.—Work has been completed at the new factory of the Sandusky Auto Parts and Motor Truck Co. and the plant is now in operation. About 150 skilled mechanics are employed, the number to be rapidly increased. Indianapolis and Columbus capitalists are back of the project.

Columbus, O.—F. E. Avery who conducts a garage and sales agency at 1199 Franklin avenue, has completed extensive improvements at his establishment. Last year he erected a fireproof addition to the agency, increasing its floor space by 100 per cent and recently he has completed the fireproofing of the older part. The wooden floors were removed and concrete floors were installed.

Columbus, O.—The Adamson Automobile Co., 35 West Mound street, has taken the central Ohio agency for the Haynes, Jackson and Brush.

Pittsburg, Pa.—J. A. Stranahan, formerly with the White Co., has been appointed sales manager of the Haynes Motor Car Co. in this city.

Columbus, O.—Robert F. Boda & Co., of North Fourth street, Columbus, has taken the central Ohio agency for the Randolph truck. The company will control about a dozen counties.

Charleroi, Pa.—The plant of the Charleroi Automobile Co. at Charleroi, Pa., was destroyed with three new cars recently. The damage is estimated at $15,000, only partly covered by insurance.

Madison, Wis.—The Pregler garage at 323 West Johnson street is to be enlarged. plans are being drawn for addition of two full stories on the present two. The new space will be used for repairs, paint shop and tire repairs.

Baltimore, Md.—The new showrooms of the Stoddard-Dayton Automobile Co. of Baltimore, Leo Shaab manager, have been opened. They are located opposite to the old building on Mount Royal avenue near Maryland avenue.

Milwaukee, Wis.—The Johnson Service Co., builder of pleasure and commercial cars, has opened a retail selling branch and show rooms in the building formerly occupied by the Wisconsin Auto Exchange, 241 Wisconsin street.

Chicago—The Federal Motor Car Co., of which J. L. Carson is manager, has opened an Enger agency at 2337 Michigan avenue, a new three-story building. The Federal company has the Enger for Illinois, Wisconsin, northern Indiana and southern Michigan.

Pittsburg, Pa.—The co-partnership hitherto existing between N. M. and P. L. Johnson, trading as the Motor Cycle Exchange at 106 Whitfield street, east end, has been dissolved by mutual consent. The business will now be conducted by H. T. McK. Hayne and Albert G. Schmitt of Pittsburg.

Racine, Wis.—The Reliance Wrench Co. has been incorporated at Racine to manufacture an adjustable wrench which is especially adapted to motor car work. The capital stock of the new corporation is $25,000 and Nels Christensen and Andrew Matson are the leading stockholders. For the present the wrench is being manufactured for the concern by the Belle City Malleable Iron Co. and Racine Steel Co., of Racine. A plant will be erected at Racine later.

Lafayette, Ind.—John A. Rice, of Frankfort, Ind., has taken over the Maxwell agency for Clinton county in this state.

Columbus, O.—The Curtin-Williams Automobile Co. has moved from its old location at 122 Parsons avenue to new quarters at 86 North Fourth street. The new establishment is 32 by 192 feet.

Akron, O.—John J. Moriarty, superintendent of the Pennsylvania Rubber Co. of Jeanette, Pa., has been appointed general superintendent of the Canadian branch of the Goodyear Tire and Rubber Co., at Bowmanville, Can.

New York—George A. Crane has recently joined the sales department of the Columbia Motor Car Co., of Hartford, Conn. After approximately 7 years of service with Knox, he resigned to join the Columbia sales department, being located at the factory in Hartford.

Columbus, O.—Papers were filed with Secretary of State Thompson changing the name of the Motz Clincher Tire and Rubber Co., of Akron, Ohio, to the Motz Tire and Rubber Co. The reason for the change is to increase the number of different tires manufactured by the company. A. B. Hamlen is president and H. H. McClosky, secretary.

Benson, Minn.—Wright Brothers have recently erected a cement block building 40 by 60 feet for garage purposes. It is equipped with machinery for repair work and a line of motor car supplies, greases and oils is carried. The probabilities are that by spring a new addition 20 by 40 feet will be added, making the total garage and salesroom 40 by 80 feet.

Sacramento, Cal.—Richard H. Zinke, California representative for the Corbin car, has established an agency and garage at 1916 M street, with Frank Murray, formerly connected with the Buick agency at San Francisco, as manager. C. C. Eichelberger, general manager of the Firestone Tire Co. at San Francisco, will establish an agency for these tires at the new garage.

Toledo, O.—The Dusseau Fore and Rear Drive Auto Co. has not yet settled upon a site for its proposed plant. The North Toledo Improvement Association is making an effort to locate it in that part of the city, offering to donate a site on the Terminal railroad, and take a block of the company's stock. Several other northwestern Ohio towns are also bidding for the plant.

Recent Incorporations

New Haven, Conn.—White Motor Co., capital stock $5,000; incorporators, P. Raymond Greist, H. M. Grist and W. A. Rutz.

Plainfield, N. J.—Wilcox Auto Co., capital stock $25,000; to manufacture motor cars; incorporators, A. R. Wilcox, A. C. Wilcox and A. S. Logan.

Chicago—Grabowsky Power Wagon Co., capital stock $25,000; motor cars, motor wagons and accessories; incorporators, H. L. Neuman, E. O'Connor and W. W. Witty.

New York—Auto Supply Co., capital stock, $100; to deal in motor cars and accessories; incorporators, S. K. Lichtenstein, H. M. Wise, and W. F. Ashley, Jr.

Port Jervis, N. Y.—Rutan Auto Co., capital stock, $45,000; to manufacture and deal in motor cars, engines, etc.; incorporators, P. C. Rutan, J. S. Rutan and J. A. Rutan.

Montclair, N. J.—Union Garage Co., capital stock, $25,000; to conduct a motor car garage; incorporators, F. A. Jackson, A. F. Rainer and G. A. Douglas.

From the Four Winds

REO Given a Cup—Referee Stevens, of Kansas City, with the approval of the A. A. A., has awarded to the Reo the class B silver cup of the recent Kansas Magazine reliability run. The donor of the cup is Colonel Samuel E. Woolard, and the trophy is now in the hands of the Wichita Auto Co., Wichita, Kan., under whose direction the Reo car was driven.

Vancouver Show in Doubt—Practically at the last moment, and because of a sudden estrangement between the dealers and the promoters, the show which was to have been held the latter part of this month by the Vancouver Motor Trade Association at Vancouver, B. C., has been called off temporarily. Just when the project will be taken up again is not definitely known, but the people of Vancouver have been definitely assured that it will be resumed.

Columbus' New Committee—The Columbus Automobile Club, of Columbus, Ohio, has appointed a new contest and show committee, consisting of Perin B. Monypeny, Herman Hoster and William Frisbie, and preparations are being made for an active season under the presidency of Norman O. Aeby. Plans are being laid for an endurance run to be pulled off some time in February, and in addition a number of short endurance and pleasure runs will be arranged during the winter.

Money For Roads Asked—The third bill introduced in the 1911 session of the Wisconsin legislature was that by Senator Timothy Burke, of Green Bay, friend of the Wisconsin motorist, and providing for an annual appropriation of $300,000 for the period of 6 years for construction work on highways, the work to be carried out under the direction of a commission of three members. The commission plan was recommended in the governor's message. It is proposed to distribute the amount among the various counties on the basis of highway mileage, amount of highway improvements, and valuation of taxable property.

No Room for Supply Men—The Spokane Automobile Dealers' Association held a business meeting and banquet during the past week. It was decided to eliminate supply dealers from the association. This was not done on account of any hard feelings, but the car men believe that the interests of the two are entirely different and that each should have an association of its own. None but bona fide car dealers will be taken into the association, and curbstone dealers and dabblers will be barred. Owing to the fact that some of the old officers have gone out of business new officers were elected to take their places. Stanley W. Smith was elected president, L. D. Hodgins, vice-president; H. H. Eastman, secretary, and H. J. Banta, treasurer. It was also decided to form a traffic committee, to keep watch on traffic conditions in the city. Another duty of this committee will be to watch for dangerous crossings and report them.

Omaha After Circuit Date—Following the receipt of a letter by the secretary of the Omaha Motor Club, from the A. A. A. contest board, in regard to the condition of the Omaha speedway and how the club stood on the proposition of a national circuit, a meeting of the club was held last week. The club members were unanimous in their belief that a national circuit date of this kind would be of great benefit to the trade and should be backed as strongly as possible. To that end there was a discussion of the still better improvement of the speedway, which is a 1-mile dirt track. One of the problems to be confronted is that of transportation to the speedway, and members of the speedway association stated that this question was being taken up with both the street car company and the railroad.

Against a Wheel Tax—The Sioux City Automobile Dealers' Association went on record last week with a formal protest against the assessment of a wheel tax, which is provided for in a bill which is to be presented at the present session of the legislature. Petitions are now being circulated. The dealers assert that the regular assessment that is levied on the value of the vehicles, in addition to the state license of $5, is a sufficient tax on the owners and that a wheel tax imposed by municipalities would be an unfair burden. They also wish to see the funds derived from the general taxation of motor cars, and from the state license fees, appropriated for good roads purposes. The funds derived from these two sources amount to approximately $750,000 a year.

Conflicts With State Law—The Milwaukee common council has turned down the ordinance introduced by Alderman Corcoran to license all operators of motor cars and to permit no person under 16 years of age to operate a motor vehicle. It was found that the ordinance was in violation of the state statutes, which provide that no municipality shall pass any restrictive law in contravention of the state statutes and that the proposed ordinance placed a limitation on the right to operate motor vehicles in Milwaukee. An ordinance requiring motor cars to stop when approaching street cars which are letting on or discharging passengers has been recommended for passage and will be adopted. The object is to lessen the chances of injury or death. The garage ordinance has been adopted and eight applications for the construction of large garages, which have been held up pending disposition of the ordinance, will now be acted upon. Another ordinance that will receive favorable action is that which provides that no gasoline engine shall be operated in residence districts unless provided with a muffler.

Michigan After Big Tax—Representative Graves, of Adrian, Mich., has presented a bill in the house which provides that in place of the customary $3 fee now paid for a license that the charge for a state license and number plate shall be 30 cents per horsepower, or, in other words, a raise of nearly 200 per cent over what is now paid. The bill also provides that manufacturers shall pay $25 for the first number plate and $2 for each additional plate, which is about the same as charged under the present law.

Portlanders Will Help—Evidence that the work that the Pacific Highway Association is doing is meeting with the approval of the public at large was shown conclusively when the Portland Automobile Dealers' Association last week voted to formally affiliate with the good roads organization and assist in promoting the international highway from Canada to Mexico. The Portland dealers will not stop at giving their moral support, but have voted annual dues of $400, to be paid into the treasury of the P. H. A. immediately.

More Trophies Offered—The gift of two trophies to be competed for, in addition to the Milwaukee Sentinel trophy, in the annual reliability run held under the auspices of the Wisconsin State Automobile Association, was announced previous to the annual meeting of the association during the third annual Milwaukee show. The Milwaukee Journal offers a large silver cup, valued at $750, to the touring car making the best showing in the 1911 tour. The Evening Wisconsin offers a large French clock, valued at $500, to the roadster or runabout making the best score.

Hunt Buffalo in Car—The National 40 is the first and probably the last car to be used in hunting down and killing a buffalo. The speed of the big motor car was pitted against that of the ex-king of the prairie recently in Anoka county, Minnesota, a few miles out of Minneapolis. A mad buffalo had been terrorizing the inhabitants of the country and a call was sent to Minneapolis for help. The Twin City Motor Co., of Minneapolis, furnished the National and shortly after the telephone call came for assistance the car, loaded with hunters and rifles, was on the way. The buffalo was killed after an exciting chase.